

An Analysis Report on  
**Underlying Assets**  
&  
**Deliverable Equity Futures & Options**

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from  
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**FIN F311 Derivatives and Risk Management**



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# Abstract

This portfolio analysis report aspires to analyse the equity and derivatives of 8 companies from diverse sectors of the Indian Market. The selected time frame is 1<sup>st</sup> October 2018 to 30<sup>th</sup> September 2019.

A quick introduction explaining the nature of business, structure of ownership, its influence on the market and its overall importance is provided for each company of the portfolio. As this fulfils the qualitative analysis, thorough quantitative analysis is provided through the comparison of returns. The returns on equity were measured and plotted on a graph against dates on a daily, weekly and monthly rate. To provide a more practical view the returns were then adjusted for risk by deducting T-Bill rate for the same frequency. This shows the excess returns gained.

Sharpe Ratio was computed to understand the excess return per unit of risk undertaken; Following this are tabular formatted Mean Return, Maximum Return, Minimum Return and Standard Deviation. A comparable procedure was then employed to understand the equity derivatives of such stocks.

Futures price was obtained from the clearing house for daily, weekly and monthly rate for the above-mentioned time frame. To provide a more practical view the returns were then adjusted for risk by deducting T-Bill rate for the same frequency. This shows the excess returns gained.

Further a comparison has been made between equity returns and futures returns. Analysing the trends then a note on contango and backwardation has also been attached.

As far as options are concerned, the options price was calculated using the binomial theorem method, this was then compared to the actual settle price.

This report thus seeks to understand returns through various financial instruments in a well diversified portfolio, and tries to make a case for the best available portfolio.

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We are extremely thankful to Dr.Thota Nagaraju for providing us with an opportunity to work on this project. This project was a wonderful way of applying what we have learnt in our course by analyzing the data, none of which would have been possible without his help and crucial inputs. We would also like to express our most heartfelt gratitude towards him for his patience and invaluable time by guiding us through each step of this project. We are also thankful to the Economics Department of BITS that has created such provisions for students to participate in fun, innovative projects that give us a hands on experience in applying our knowledge. This project has certainly developed our skills and given us the necessary tools to excel further in our field. It was challenging and laborious but the knowledge gained from it will impact each member of the team in new ways. Once again we thank you Dr. Thota Nagaraju for being a mentor and guide and hope to work with you again soon.

# Equity

## Apollo Tyres

### Introduction



Apollo Tyres Ltd is the world's 7th biggest tyre manufacturer, incorporated in 1972. It began operations by setting up its first plant in Peramba, Thissur, Kerala, India. The company has since expanded phenomenally with four manufacturing units in India, one in the Netherlands and one in Hungary. Its vast network consists of no less than nearly 5,000 dealerships in India, more than 2,500 of which are exclusive outlets.

### Nature of business

Apollo Tyres is one of India's leading tyre manufacturers and one of the major producers of tyres in the world. It currently offers an entire range of automotive tyres for ultra and high speed passenger cars, trucks and buses, farm, off-the-road, industrial and specialty applications like mining, retreaded etc in the products it has.

### Products:

- Passenger Car - Radial, Crossply and SUV.
- Acelere Wheelz.
- Light Truck - Radial and Crossply.
- Truck and Bus - Radila, Crossply and Kaizen.
- Farm.
- Speciality.

- DuraTread.
- Dura Tyre

### **Services:**

- Passenger Car.
- Truck and Bus.
- Farm.
- Alloy Wheels

### **Ownership**

Apollo Tyres Ltd is a public company and is India's second-largest tyre maker. Onkar S. Kanwar is the managing director and a major stakeholder of the company. With his vision, Apollo Tyres has grown tremendously and transformed into the global giant that it is today. Shareholding pattern of the company:

No.	Name of the Shareholder	Total Shares held		Shares pledged or otherwise encumbered		
		Number	As a % of grand total (A) + (B) + (C)	Number	% of Total shares held	As a % of grand total (A) + (B) + (C)
1	Neeraj Consultants Pvt Ltd.	73,827,161	12.91	5,270,000	7.14	-
2	Onkar S Kanwar	100,000	0.02	-	-	-
3	SHALINI KANWAR CHAND	1,977,000	0.35	-	-	-
4	Neeraj Kanwar	671,380	0.12	-	-	-
5	Raaja R S Kanwar	180,880	0.03	-	-	-
6	APOLLO FINANCE LTD.	39,778,872	6.95	4,005,000	10.07	-
7	Sunrays Properties & Investments Co. Pvt Ltd.	36,307,648	6.35	12,164,000	33.5	-
8	Taru Kanwar	12,250	0	-	-	-
9	Simran Kanwar	18,500	0	-	-	-
10	APOLLO INTERNATIONAL LTD.	984,485	0.17	984,485	100	-

[https://www.moneycontrol.com/bse/shareholding/shp\\_promoters.php?sc\\_dispid=AT14&classic=true](https://www.moneycontrol.com/bse/shareholding/shp_promoters.php?sc_dispid=AT14&classic=true)

## Inception and circumstances

Apollo Tyres Ltd. was incorporated on 28 September 1972 as a Public Limited Company. Its first manufacturing facility was commissioned in Peramba Plant, Thissur, Kerala, India in 1977. The company focused on the production of truck tyres in India and introduced its first truck tyre, Rajdhani in India. The company has been relentless with their efforts and now with four manufacturing units in India, one in the Netherlands and one in Hungary.

## Industry and significance

Apollo Tyres is one of the leading manufacturers of tyres in India and globally. It gets 69% of its revenues from India, 26% from Europe and 5% from plants at other locations. The company which has been on the verge of bankruptcy, through a combination of conviction and the strength to take on any adversity, made Apollo Tyres the industry leader it is today. Market cap of Apollo:

#	Company Name	Last Price	% Chg	52 Wk High	52 Wk Low	Market Cap. (Rs. Cr.)
1	<a href="#">APOLLO TYRES</a>	246.00	0	244.85	144.05	9447.41
2	<a href="#">JK TYRE</a>	150.00	0	111.5	54.65	1737.16
3	<a href="#">SUNDRAM FASTENERS</a>	512.20	0	595.75	399.1	9878.13
4	<a href="#">GREAVES COTTON</a>	130.70	0	156.85	112.35	3266.27
5	<a href="#">RANE BRAKE LINING</a>	1212.85	0	769	450	404.77
6	<a href="#">JBM AUTO</a>	543.20	0	328	135.5	914.02
7	<a href="#">SUBROS</a>	250.90	0	303	162.8	1578.38
8	<a href="#">GNA AXLES</a>	362.10	0	408	210.3	582.89
9	<a href="#">PPAP</a>	372.55	0	404.75	154	248.22
10	<a href="#">WABCO INDIA</a>	6209.45	0	7100	5840.1	11705.09

<https://www.dynamiclevels.com/en/apollo-tyres-market-cap>



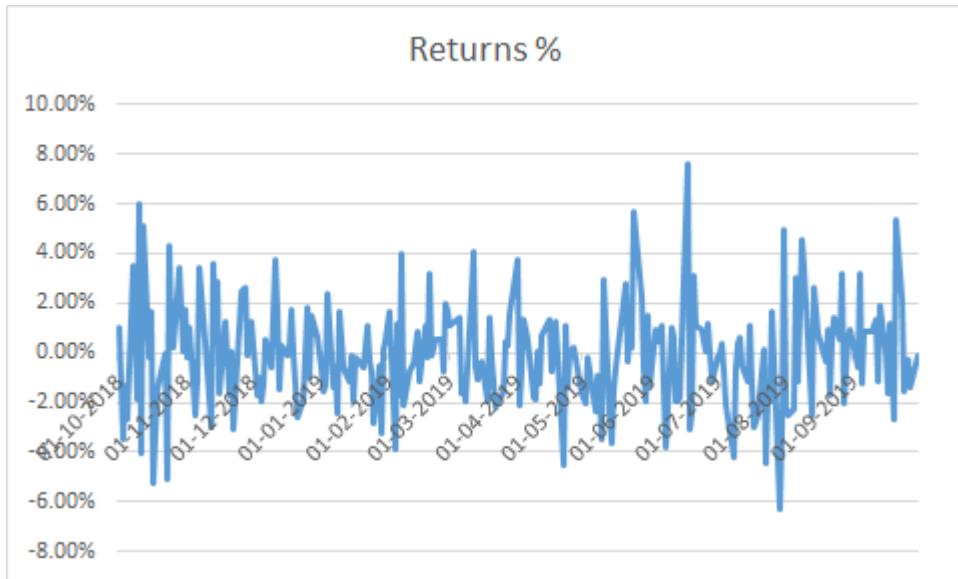
[1852/792/?utm\\_source=bottomviews&utm\\_medium=website&utm\\_campaign=related-articles&utm\\_content=articlelinks](https://www.semrush.com/reviews/1852/792/?utm_source=bottomviews&utm_medium=website&utm_campaign=related-articles&utm_content=articlelinks)

## Unadjusted Returns

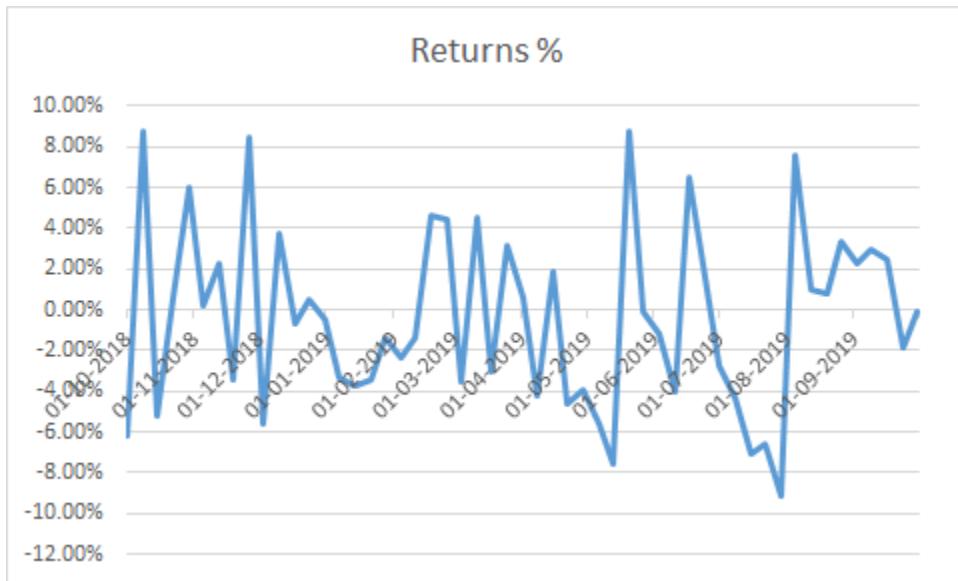
Returns	Daily	Weekly	Monthly
Mean	-0.0846%	-0.3732%	-1.7355%
Max	7.6019%	8.7873%	8.4710%
Min	-6.2844%	-9.1121%	-27.3968%
Standard Deviation	0.0214	0.0444	0.1083

## Adjusted Returns

Returns	Daily	Weekly	Monthly
Mean	-0.1018%	-0.4905%	-2.2530%
Max	7.5855%	8.6696%	7.9085%
Min	-6.3001%	-9.2163%	-27.8743%
Standard Deviation	0.0214	0.0444	0.1082



*Daily*



*Weekly*



*Monthly*

## Economic Interpretation

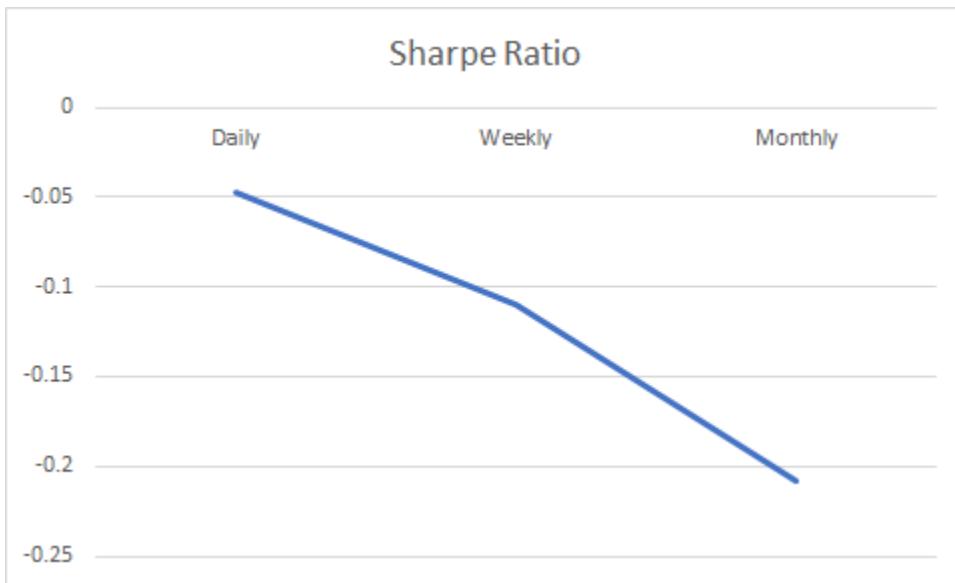
### Risk Adjusted Return:

Returns calculated without accounting for Risk Free Rate do not paint a complete picture. When adjusted with risk, the return indicated whether it's worth taking the risk for the accrued return over the risk free rate. Share Ratio is extensively used to express the risk adjusted return.

Sharpe Ratio =  $(\text{Unadjusted Return} - \text{Riskfree Rate}) / \text{Standard Deviation}$

The reason Risk Adjusted Return will always be less than Risk Unadjusted Return because it is more practical. It clearly shows that if the risk adjusted returns is not positive the investor might be better off investing in riskfree instruments.

Frequency	Sharpe Ratio
Daily	-0.0474
Weekly	-0.1104
Monthly	-0.2080



## Observations

- Risk Adjusted Returns and Risk Unadjusted Returns share almost the same volatility and Standard Deviation
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns

## Actions

- Monthly Returns offer lower return while the risk is higher due to the addition of time period risk. A Risk Tolerant wouldn't be recommended this stock.
- A stock such as the one presented above would be apt for day trading and not for long term investments
- However, considering that even the ultra short term returns are negative it would be better to invest in risk free instruments

# Arvind

## Introduction



Arvind Limited is the forerunner company of the Lalbhai Group and focuses in textile manufacturing. The principal products of Aravind are finished fabrics and garments. They have since branched out to a variety of segments, that is, textiles; brands and retail; real estate. Arvind is headquartered in Ahmedabad, Gujarat.

### 1. Nature of business:

Arvind covers a wide range of services from textiles to retail. They have extensive textile products such as fabric, yarn and garment. In terms of retailing they use branded garments, apparels and fabrics. Another aspect is real estate development. Additional services are cotton shirting, denim, knits, khakis, jeans and shirts.

FABRICS	GARMENT EXPORTS
<ul style="list-style-type: none"><li>• Denim</li><li>• Shirtings</li></ul>	<ul style="list-style-type: none"><li>• Shirts</li><li>• jeans</li></ul>

<ul style="list-style-type: none"> <li>• Khaki</li> <li>• Knitwear</li> <li>• voile</li> </ul>	
--	--

Brands owned by Arvind:

- Flying machine
- Quads
- Ruf & Tuf
- Excalibur
- ls
- Creyate
- Arvind RTW (Exclusively available at The Arvind Stores)

## 2. Ownership:

Arvind is a private company started in 1897. They're a part of the Lalbhai Group due to which they became a 1 billion dollar Indian conglomerate that manufactures textiles and is one of the biggest denim manufacturers in the world. Major shareholders include:

No.	Name of the Shareholder	Total Shares held		Shares pledged or otherwise encumbered		
		Number	As a % of grand total (A) + (B) + (C)	Number	% of Total shares held	As a % of grand total (A) + (B) + (C)
1	Aura Securities Private Limited	95,561,910	36.93	4,250,000	4.45	-
2	Sanjaybhai Shrenikbhai Lalbhai	1,564	0	-	-	-
3	Jayshreeben Sanjaybhai Lalbhai	345	0	-	-	-
4	Arvind Fashions Limited	0	0	-	-	-
5	The Anup Engineering Limited (Formerly known as Anveshan Heavy Engineering Limited)	0	0	-	-	-
6	Punit Sanjaybhai	3,714	0	-	-	-
7	Kulin S Lalbhai	0	0	-	-	-
8	Arvind SmartSpaces Limited	0	0	-	-	-
9	Aura Merchandise Pvt Ltd.	100	0	-	-	-
10	Lalbhai Poorva Punitbhai	0	0	-	-	-

[https://www.moneycontrol.com/bse/shareholding/shp\\_promoters.php?sc\\_dispid=A18&classic=true](https://www.moneycontrol.com/bse/shareholding/shp_promoters.php?sc_dispid=A18&classic=true)

### 3. Inception and Circumstances:

In the year of 1931, three brothers Kasturbhai Narottambhai and Chimanbhai started Arvind Ltd as Arvind Mills. Within three years they became on the top textile units of the country and the first company to bring global products to India.

### 4. Industry and significance:

At present, Arvind Ltd is a 1.7 billion dollar conglomerate that manage many famous apparel brands such as Tommy Hilfiger, US Polo, Calvin Klein, Gap, Nautica and Sephora. They're the top denim manufacturer of India and have been dominating the market for the past three decades.

#	Company Name	Last Price	% Chg	52 Wk High	52 Wk Low	Market Cap. (Rs. Cr.)
1	ARVIND	389.80	0	326.9	41.85	1358.53
2	NAHAR IND	103.20	0	70.5	20.35	106.96
3	TRIDENT	101.35	0	75.7	52	3238.48
4	ALOK INDUSTRIES	3.00	0	6.65	1.4	247.92
5	RAYMOND	861.15	0	885	533.45	4959.57
6	KPR MILL	726.60	0	685.85	511.2	4739.67
7	SWAN ENERGY	153.30	0	135	91.25	2492.64
8	NITIN SPINNERS	106.20	0	99.4	46	304.15
9	WELSPUN INDIA	61.25	0	66	45.3	5726.93
10	JBF INDUSTRIES	198.80	0	28.85	6.05	58.13

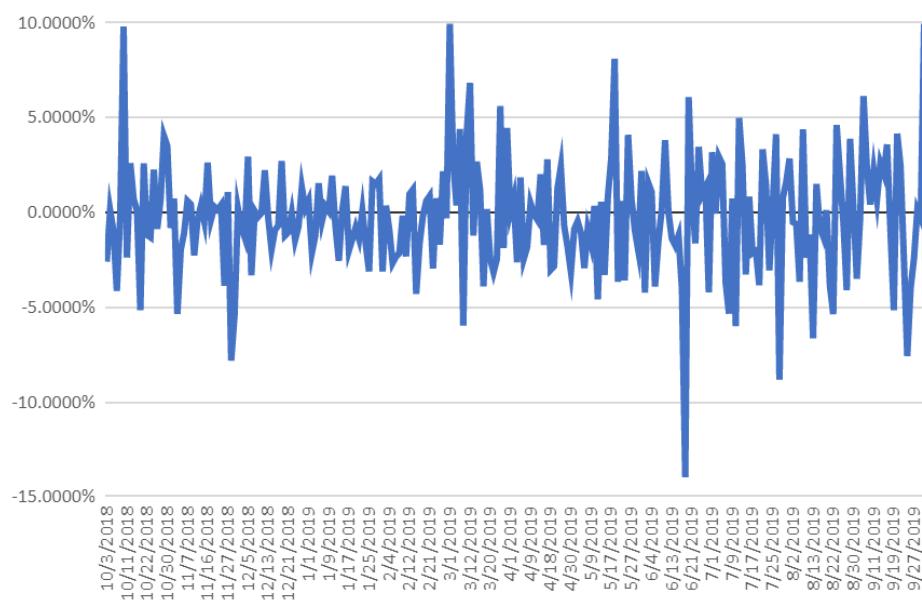
<https://www.dynamiclevels.com/en/arvind-market-cap>

##### 5. Overall greatness:

- In 1987, the company had the foresight to take up a modernisation programme to tripling the production of denim cloth and producing double yarn fabrics for exports. It also had the largest zero discharge green effluent treatment plant in India in 1987.
- In 1998, Arvind Mills dominated the markets and became the world's third largest manufacturer of denim.
- Arvind was the first Indian company to elevate the cotton textile business from cotton fields to apparel retailing.
- Arvind received The National Energy Conservation Award 2015 in textiles category, for the second year in a row due to the massive energy savings achieved through various initiatives by its unit in Santej, Gujarat.



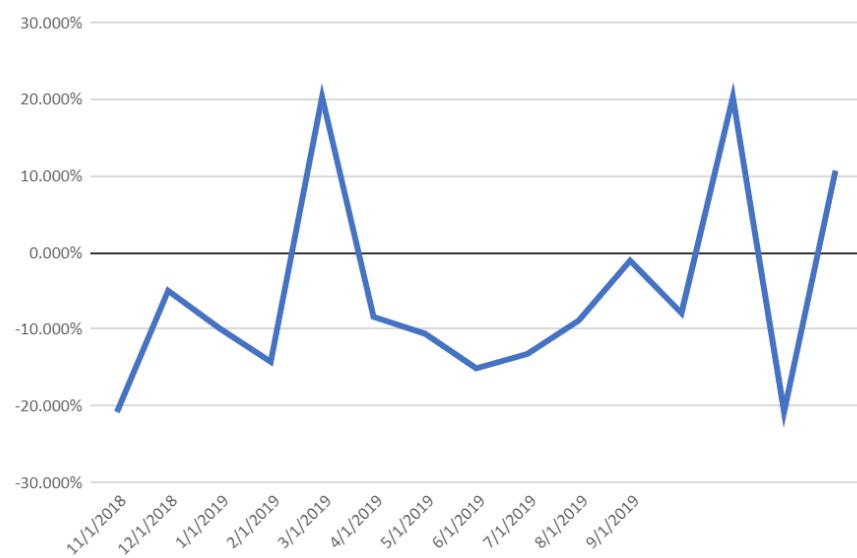
Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.3481%	-1.6291%	-8.385%
<b>Max</b>	9.9030%	13.9352%	19.794%
<b>Min</b>	-13.9917%	-15.3025%	-21.351%
<b>Standard Deviation</b>	2.9762%	5.6103%	10.729%



Daily



Weekly



Monthly

## Economic Interpretation

### **Risk Adjusted Return:**

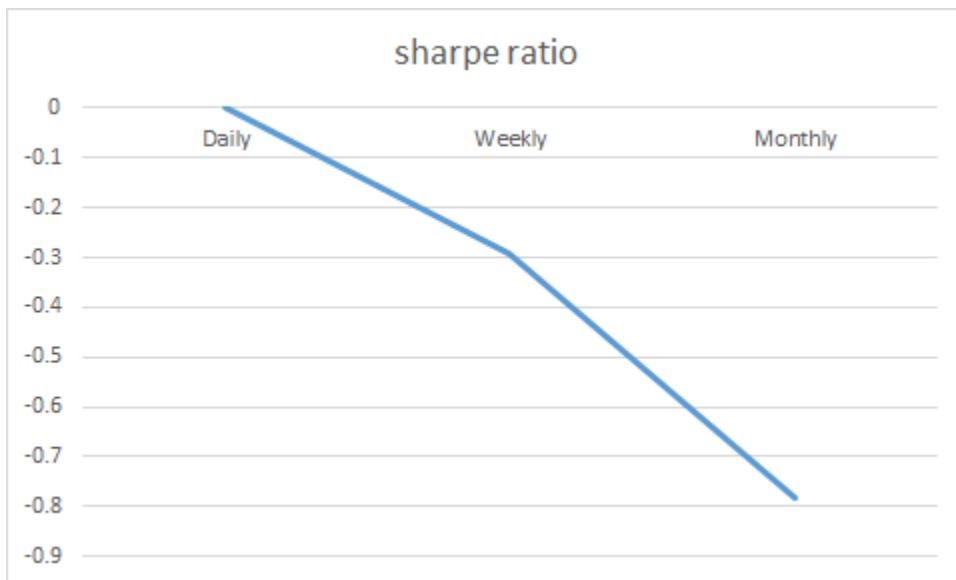
Returns calculated without accounting for Risk Free Rate do not paint a complete picture. When adjusted with risk, the return indicated whether it's worth taking the

risk for the accrued return over the risk free rate. Share Ratio is extensively used to express the risk adjusted return.

Sharpe Ratio =  $(\text{Unadjusted Return} - \text{Riskfree Rate}) / \text{Standard Deviation}$

The reason Risk Adjusted Return will always be less than Risk Unadjusted Return because it is economically more practical. It clearly shows that if the risk adjusted returns are not positive the investor might be better off investing in risk free instruments.

<i>Frequency</i>	<i>Sharpe Ratio</i>
Daily	-0.1169
Weekly	-0.2903
Monthly	-0.7815



## Observations

- Risk Adjusted Returns and Risk Unadjusted Returns share almost the same volatility and Standard Deviation
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns
- There was a huge dip in Arvind share price on 28th November 2018 as it traded ex-demerger from 28 th onwards. Share price went down up to 65% due to this.

## Actions

- Monthly Returns offer lower return while the risk is higher due to the addition of time period risk. A Risk Tolerant wouldn't be recommended this stock.
- A stock such as the one presented above would be apt for day trading and not for long term investments
- However, considering that even the ultra short term returns are negative it would be better to invest in risk free instruments

# Ashok Leyland

## Introduction

### Unadjusted Returns

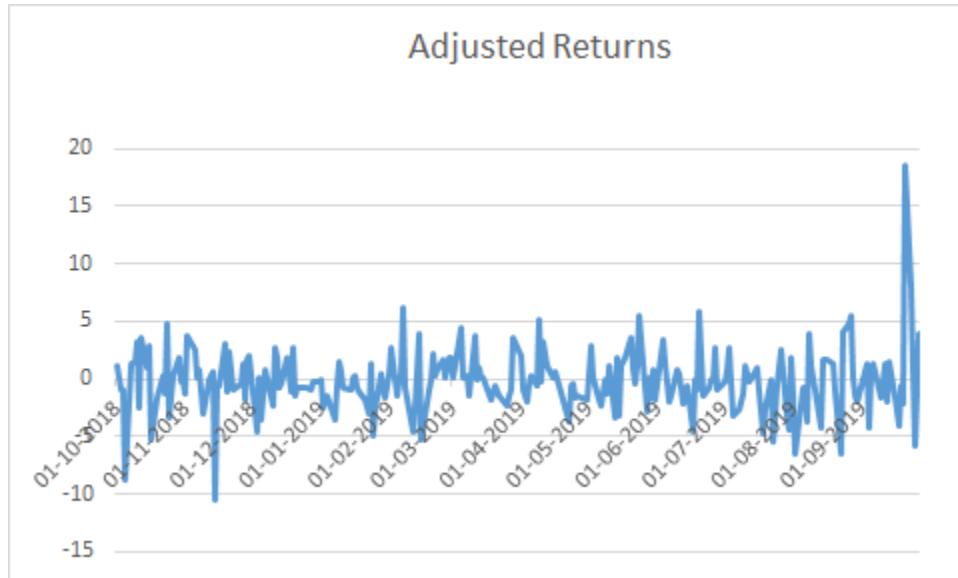
Returns	Daily	Weekly	Monthly
Mean	-0.1864%	0.2697%	-4.6663%
Max	18.4934%	13.5672%	6.5942%
Min	-10.5044%	-7.6724%	-20.6823%
Standard Deviation	2.7864%	3.6595%	8.9973%

### Adjusted Returns

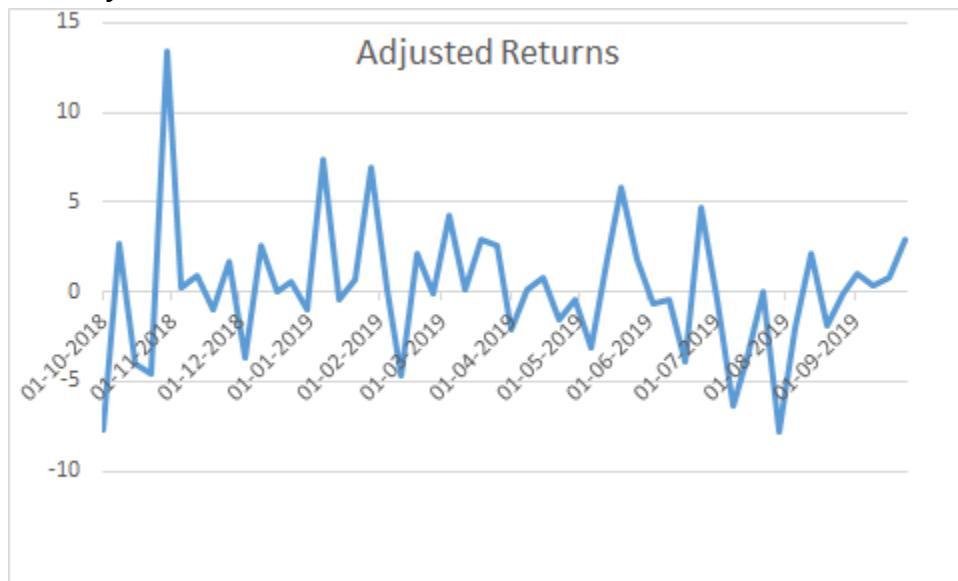
Returns	Daily	Weekly	Monthly
Mean	-0.1864%	0.2692%	-4.6663%
Max	18.4931%	13.5671%	6.5942%

<b>Min</b>	-10.5042%	-7.6728%	-20.6829%
<b>Standard Deviation</b>	2.7865%	3.6596%	8.9979%

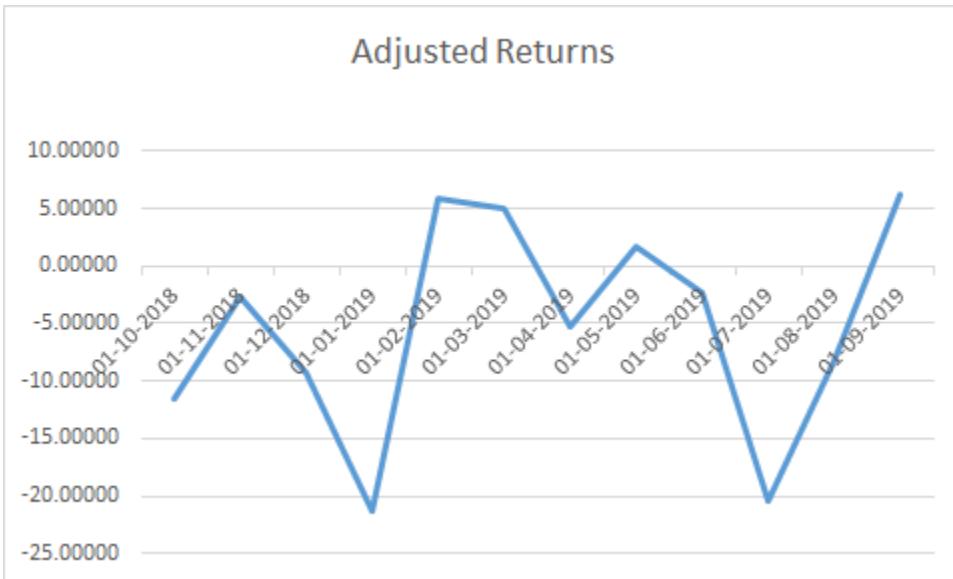
Daily:



Weekly:



Monthly:



## Economic Interpretation

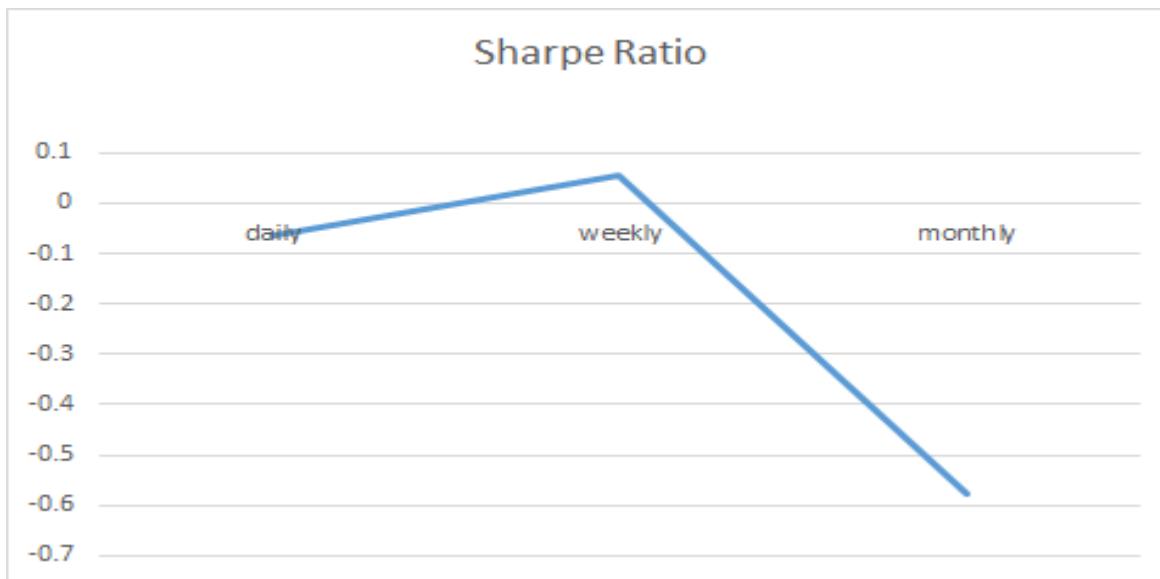
### Risk Adjusted Return:

Returns calculated without accounting for Risk Free Rate do not paint a complete picture. When adjusted with risk, the return indicated whether it's worth taking the risk for the accrued return over the risk free rate. Share Ratio is extensively used to express the risk adjusted return.

Sharpe Ratio =  $(\text{Unadjusted Return} - \text{Risk Free Rate}) / \text{Standard Deviation}$

The reason Risk Adjusted Return will always be less than Risk Unadjusted Return because it is more practical. It clearly shows that if the risk adjusted returns is not positive the investor might be better off investing in risk free instruments.

<i>Frequency</i>	<i>Sharpe Ratio</i>
Daily	-0.0637
Weekly	0.0539
Monthly	-0.576



## Observations

- Risk Adjusted Returns and Risk Unadjusted Returns share almost the same volatility and Standard Deviation
- Mean Returns show an uncertain trend in Daily, Weekly and Monthly Frequency
- Volatility does not increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns

## Actions

- Monthly Returns offer lower return while the risk is higher due to the addition of time period risk. A Risk Tolerant wouldn't be recommended this stock.
- A stock such as the one presented above would be apt for day trading and not for long term investments
- However, considering that even the ultra short term returns are negative it would be better to invest in risk free i

# Asian Paints

## Introduction



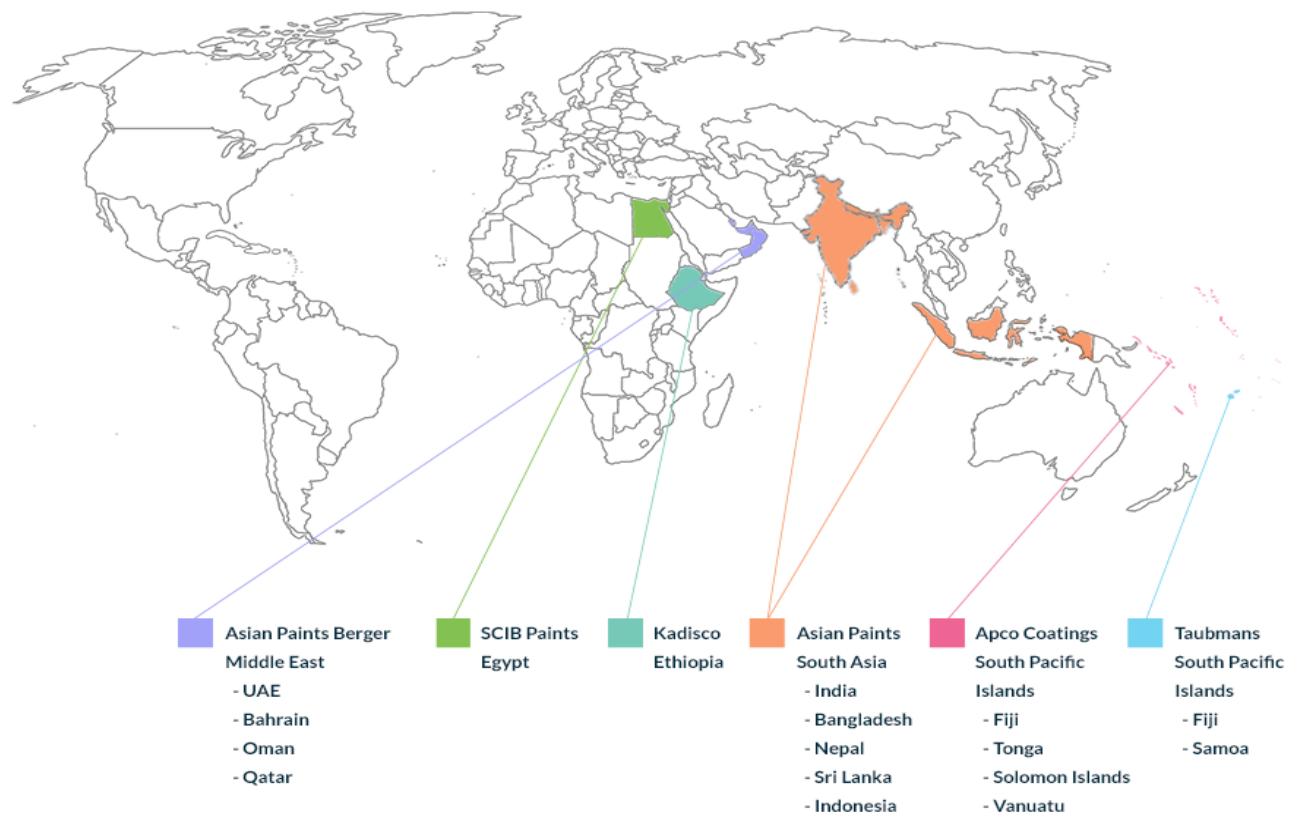
Asian Paints Limited is an Indian multinational paint company headquartered in Mumbai, Maharashtra. The company is engaged in the business of manufacturing, selling and distribution of paints, coatings, products related to home decor, bath fittings and providing related services. Started in a garage in 1945, this company has become a major player in the Indian paint industry and established its presence across the globe.

### 1) Nature of business:

Asian Paints manufactures a wide range of paints for decorative and industrial use. The products provided by the company include ancillaries, automotive, decorative paints, and industrial paints. The variety of products it offers:

ANCILLARIES	INTERIOR	EXTERIOR	METAL FINISHES	WOOD FINISHES
1. Decoprime synthetic cement primer -ST 2. decoprime synthetic cement primer WT 3. tractor oil primer 4. metal primer 5. paste filler 6. apcolite knifing 7. apcolite universal stainer 8. apcolite wood stains	1. Royale luxury emulsion 2. premuim emulsion 3. tractor emulsion 4. interior wall finish matt 5. interior wall finish lustre 6. tractor acrylic distemper 7. AP tractor synthetic distemper 8. utsav acrylic distemper	1. Apex exterior emulsion 2. apex textured exterior emulsion 3. apex ultima exterior emulsion 4. ace interior emulsion 5. exterior wall primer 6. exterior sealer	1. Apcoilite premium gloss enamel 2. apcolite premium satin enamel 3. gattu enamel 4. utsav enamel 5. apcolite hammertone 6. 3 mangoes aluminium paint	1. PU wood finish 2. AP melamyne 3. apcolite clear synthetic 4. touchwood

The company and their many subsidiaries, have operations in 22 countries across the globe with 27 paint manufacturing facilities reaching consumers in 65 countries through Berger International, SCIB Paints, Apco Coatings and Taubmans.



## 2) Ownership:

Asian Paints Ltd was incorporated in the year 1945. In the year 1965, the name of the company was changed to Asian Paints (India) Pvt Ltd. In the year 1973, the company

was converted into a public limited company. Major shareholders of the company are:

No.	Name of the Shareholder	Total Shares held		Shares pledged or otherwise encumbered		
		Number	As a % of grand total (A) + (B) + (C)	Number	% of Total shares held	As a % of grand total (A) + (B) + (C)
1	AASHAY ASHISH CHOKSI	125,380	0.01	-	-	-
2	Castle Investment & Industries Private Limited	15,457,470	1.61	-	-	-
3	Centaurus Trading And Investments Pvt Ltd	7,408,940	0.77	-	-	-
4	Ami Manish Choksi	472,200	0.05	-	-	-
5	Anay Rupen Choksi	130,500	0.01	-	-	-
6	Doli Trading And Investments Private Limited	9,363,440	0.98	-	-	-
7	Elf Trading & Chemicals Manufacturing Limited	2,108,160	0.22	-	-	-
8	Ashish Ashwin Choksi	880,840	0.09	-	-	-
9	ASHISH ASHWIN CHOKSI KARTA FOR ASHISH ASHWIN CHOKSI HUF	5,620	0	-	-	-
10	Jaldhar Investments And Trading Company Pvt Ltd	12,428,250	1.3	-	-	-

[https://www.moneycontrol.com/bse/shareholding/shp\\_promoters.php?sc\\_dispid=ap31&classic=true](https://www.moneycontrol.com/bse/shareholding/shp_promoters.php?sc_dispid=ap31&classic=true)

### 3)Inception and Circumstances:

This company is the realisation of the dream that four friends - Champaklal Choksey, Chimanlal Choksi, Suryakant Dani and Arvind Vakil saw in February 1945 when they started this company in a garage in Gaiwadi, Girgaum - Mumbai with the name of Asian Oil and Paint Company pvt ltd which became Asian paints in 1965. They have actively and fearlessly made investments to streamline their paint production facilities by improving the layout of machines, in addition to balancing equipment and replacement of old machinery to meet the demand. This company has always emphasised and recognised the importance of management and technology that has resulted in its unparalleled success.

#### 4)Industry and significance:

Asian Paints Ltd is India's largest paint company and Asia's third largest paint company. The company has manufacturing plants in Maharashtra, Gujarat, Andhra Pradesh, Uttar Pradesh, Tamil Nadu and Haryana. As of 2015, it has the largest market share with 54.1% in the Indian paint industry. It is needless to say based on the table provided below, it plays a significant role in the Indian paint industry.

EXCHANGE:	BSE	SELECT:	Consumer		
COMPANY	LATEST(RS)	CHG(%)	52 WK HIGH	52 WK LOW	MKT-CAP (RS CR)
HIND. UNILEVER	2098.50	-1.84	2187.00	1620.75	454283.27
ITC	261.30	-1.73	310.00	234.10	321077.61
ASIAN PAINTS	1806.35	-1.11	1833.65	1232.10	173265.09
TITAN COMPANY	1166.40	-0.07	1389.85	840.50	103552.99
DABUR INDIA	478.00	0.00	488.15	357.10	84467.38
GODREJ CONSUMER	739.45	-1.73	848.30	577.00	75593.98

<https://www.business-standard.com/company/asian-paints-34/peer-comparison/marketcap/bse/sector-by-sector>

#### 5)Overall greatness:

- Asian Paints had bought its first mainframe computer to be used in operations in the 1970s, in a time when the impact of computers had hardly been realised in India. This boldness and vision one of the key factors in this company's booming success.
- During World War 2 and the Quit India movement of 1942, paint imports were curtailed leaving only foreign companies and Shalimar Paints in the market. Asian Paints decided to manufacture paint locally and entered the market. By



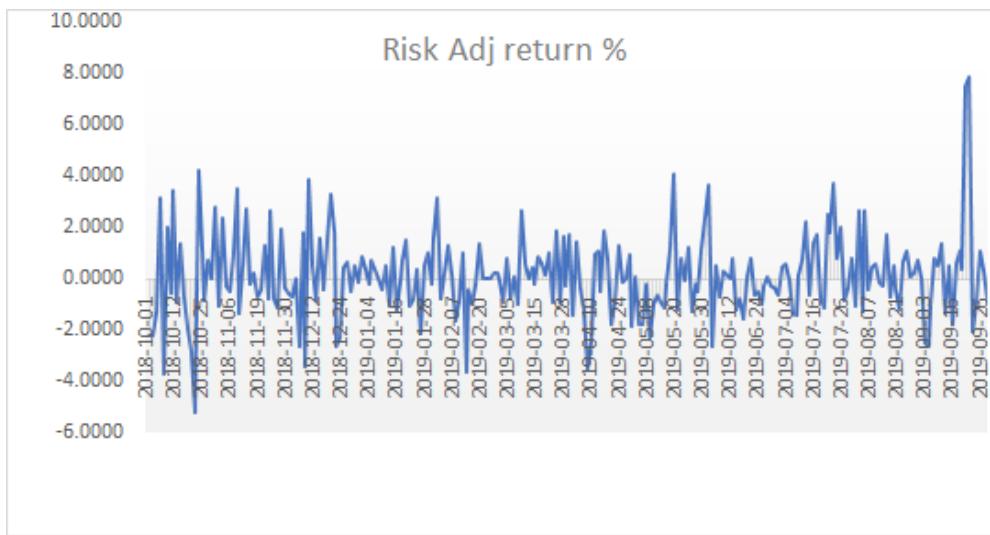
## Unadjusted Returns

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	0.1487	0.3602	1.3467
<i>Max</i>	7.8845	7.1853	12.4205
<i>Min</i>	-5.1608	-5.7698	-8.7424
<i>Standard Deviation</i>	1.6377	3.098	6.3039

## Adjusted Returns

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	0.1413	0.2406	0.8227
<i>Max</i>	7.8697	7.0514	11.8413
<i>Min</i>	-5.1798	-5.8721	-9.1941
<i>Standard Deviation</i>	1.6378	3.0929	6.28

Daily:



Weekly:

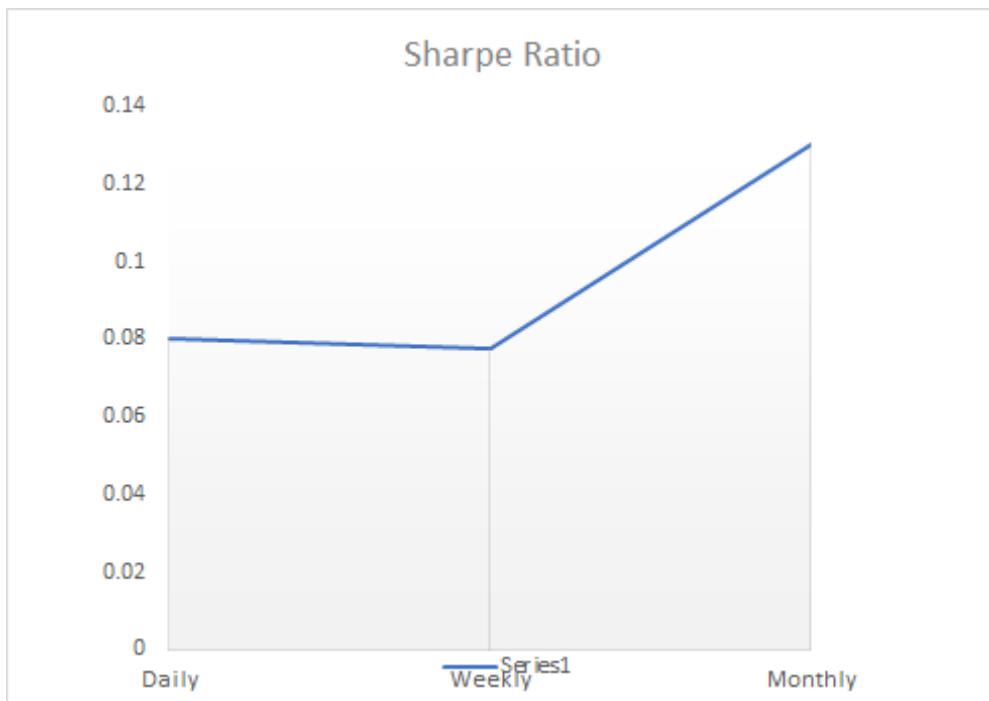


Monthly:



### Economic Interpretation:

The risk adjusted returns are always lesser than the risk unadjusted returns, as the risk adjusted returns are less the returns from T-bills. The risk adjusted return is a more economically accurate indicator, as it takes the risk free returns into account. To make profitable investments, risk adjusted returns (instead of risk unadjusted returns), should be greater than risk-free returns; otherwise greater returns can be made from government securities without any risk.



Frequency	Sharpe Ratio
Daily	0.0803
Weekly	0.0777
Monthly	0.1305

### Observations:

- The volatility and standard deviation is almost similar in risk unadjusted returns than in risk adjusted returns, though it is slightly greater in risk unadjusted returns. This implies market related risks affect the returns on the future instruments.
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns and unadjusted returns as volatility increase with time duration.
- The percentage of mean returns increase from daily, weekly to monthly in both risk unadjusted and risk adjusted returns, as greater returns are offered for greater risks taken.
- All the returns are positive and excess of T-bills returns.

**Action:**

- Hence, or a risk-averse investor, trading on a monthly basis gives greater returns but at the cost of greater risk taken(due to greater time period). He should implement a daily investment plan to get greater returns with lesser risk taken.
- It's rather better to follow a short term investment schedule for hedging purposes and trade daily instead of investing in longer weekly or monthly periods.

Since all returns are positive the investor can invest in this company rather than investing in T-bills for a given time period.

# Aurobindo Pharma

## Introduction



Aurobindo pharma limited is a pharmaceutical company headquartered in Hyderabad which was established in 1986 by Mr.PV Ramaprasad Reddy,Mr. K.Nityanada Reddy. Company have a consolidated net operating income of about Rs.2140.06 crore. Aurobindo is one of the market leaders in Semi-Synthetic penicillins and antibiotics.

### **1) Nature of business:**

Aurobindo pharma limited is a pharmaceutical manufacturing company which manufactures a wide range of generic pharmaceuticals and active pharmaceuticals .Company is operating over 125 countries. AstraZeneca and Pfizer are the major marketing partners.company is mainly focused on semi-synthetic penicillin(SSPs) and still could maintain No1 position in SSPs

production. Other than SSPs company's area of activity includes antibiotics, cardiovascular products, antiretrovirals, central nervous system product, antiallergic.

	
<b>AUROBINDO</b>	
Type	Public
Traded as	NSE: AUROPHARMA <a href="#">[1]</a> BSE: 524804 <a href="#">[2]</a>
Industry	Pharmaceuticals
Founded	1986
Headquarters	Hyderabad, Telangana, India
Area served	Client Organic Intermediates
Revenue	▲ ₹136.50 billion (US\$2.0 billion) <sup>[1]</sup> (2017)
Net income	▲ ₹19.780 billion (US\$290 million) <sup>[2]</sup> (2017)
Number of employees	16000 <sup>[3]</sup> (March 2017)
Website	<a href="http://www.aurobindo.com">www.aurobindo.com</a> <a href="#">[4]</a>

[https://en.wikipedia.org/wiki/Aurobindo\\_Pharmaceuticals](https://en.wikipedia.org/wiki/Aurobindo_Pharmaceuticals)

**2)ownership:**

Out of 585915609 total number of shares 51.87% is promoter holdings ,FIIs consist of 34.95% total share. General public holds only 8.56% of the total number of shares.

<b>Share holding</b>						
Share holding pattern as on :			30/09/2019	30/06/2019	31/03/2019	
Face value			1.00	1.00	1.00	
	No. Of Shares	% Holding	No. Of Shares	% Holding	No. Of Shares	% Holding
<b>Promoter's holding</b>						
Indian Promoters	285925934	48.80	285925934	48.80	285925934	48.80
Foreign Promoters	18000000	3.07	18000000	3.07	18000000	3.07
<b>Sub total</b>	<b>303925934</b>	<b>51.87</b>	<b>303925934</b>	<b>51.87</b>	<b>303925934</b>	<b>51.87</b>
<b>Non promoter's holding</b>						
Institutional investors						
Banks Fin. Inst. and Insurance	1954579	0.33	1376359	0.23	1413841	0.24
FII's	128642426	21.95	128686939	21.96	125779371	21.47
<b>Sub total</b>	<b>204769811</b>	<b>34.95</b>	<b>206396164</b>	<b>35.23</b>	<b>205997652</b>	<b>35.16</b>
Other investors						
Others	27073648	4.62	25958349	4.43	25850751	4.41
<b>Sub total</b>	<b>27073648</b>	<b>4.62</b>	<b>25958349</b>	<b>4.43</b>	<b>25850751</b>	<b>4.41</b>
General public	50169216	8.56	49635162	8.47	50141272	8.56
<b>Grand total</b>	<b>585938609</b>	<b>100.00</b>	<b>585915609</b>	<b>100.00</b>	<b>585915609</b>	<b>100.00</b>

Major shareholders of the company include:

No.	Name of the Shareholder	Total Shares held		Shares pledged or otherwise encumbered		
		Number	As a % of grand total (A) + (B) + (C)	Number	% of Total shares held	As a % of grand total (A) + (B) + (C)
1	M Sivakumaran	14,491,360	2.47	-	-	-
2	RPR SONS ADVISORS PRIVATE LIMITED, MRS.P.SUNEELA RANI (JOINTLY HOLDING)	196,376,250	33.51	-	-	-
3	Venkata Ramprasad Reddy Penaka	18,000,000	3.07	-	-	-
4	AXIS CLINICALS LIMITED	658,000	0.11	658,000	100	-
5	RAJESWARI KAMBAM	1,975,500	0.34	400,000	20.25	-
6	Penaka Neha Reddy	130,000	0.02	-	-	-
7	AXIS CLINICALS LIMITED, TRIDENT CHEMPHAR LIMITED, RPR SONS ADVISORS PVT.LTD. (JOINTLY HOLDING)	16,726,716	2.85	3,100,000	18.53	-
8	K Nityananda Reddy	25,359,572	4.33	5,015,000	19.78	-
9	Prasad Reddy Kambam	301,156	0.05	170,000	56.45	-
10	K Suryaprakash Reddy	7,380	0	-	-	-
11	M Sumanth Kumar Reddy	1,600,000	0.27	1,500,000	93.75	-
12	Kambam Kirthi Reddy	20,700,000	3.53	-	-	-
13	Kambam Spoorthi	7,600,000	1.3	1,930,000	25.39	-

[https://www.moneycontrol.com/bse/shareholding/shp\\_promoters.php?sc\\_dispid=AP#AP](https://www.moneycontrol.com/bse/shareholding/shp_promoters.php?sc_dispid=AP#AP)

### 3)Inception and circumstances:

Company started functioning from 1988 in puducherry .Initiated by manufacturing semi synthetic penicillin(SSPs). Manufacturing ofSSPs made aurobindo one of the top leaders in pharmaceutical sector.Both the demand and absence of competitors in the manufacturing of SSPs made Aurbindo one of the most growing companies. The growth of the company helps to being public company early in 1992. company get listed in indian stock exchanges in 1995.

#### 4)Industry and significance:

Aurobindo is one of the largest pharmaceutical companies in India. While considering the overall revenue Aurobindo holds the second top position.



<https://www.marketresearchreports.com/blog/2019/04/11/top-15-pharma-companies-india>

#### 5)Overall greatness:

Aurobindo pharma Ltd is a well growing company in the pharmaceutical sector. Company could achieve a steady sales in past 5 years. Table below shows the achievement of company in sales.

	Mar '19	Mar '18	Mar '17	Mar '16	Mar '15
Sales	12,257.89	10,303.15	9,781.21	9,322.76	8,095.10
Operating profit	2,398.97	2,670.01	2,373.95	2,287.74	2,250.42
Interest	130.92	52.89	45.16	65.27	107.25
Gross profit	2,377.65	2,697.77	2,464.74	2,410.84	2,185.49
EPS (Rs)	26.11	30.94	29.13	27.80	51.93

<https://money.rediff.com/companies/Aurobindo-Pharma-Ltd/12540244/results-annual>

In 2009 Aurobindo receives two new registrations from MCC. Company is expanding its presence all over the world . At present company has international subsidiaries in 125 countries and is working with 9500+ professionals .Aurobindo still remain as one of the leaders in pharmaceutical

Global Operations Map



field by marketing more than 300 products.

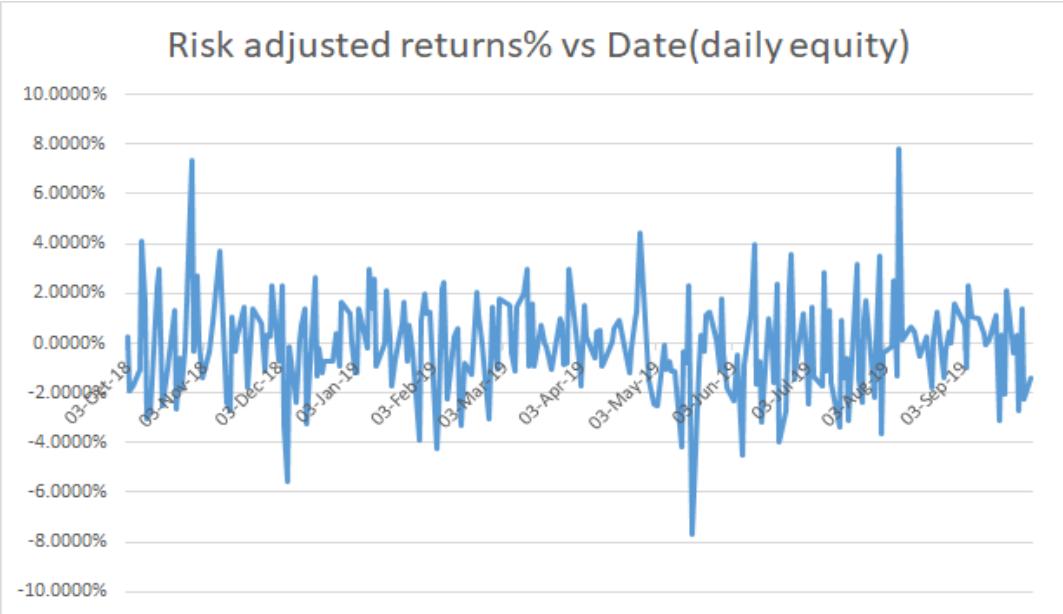
<https://www.aurobindo.com/about-us/at-a-glance/global-operations-map/>

## Unadjusted Returns

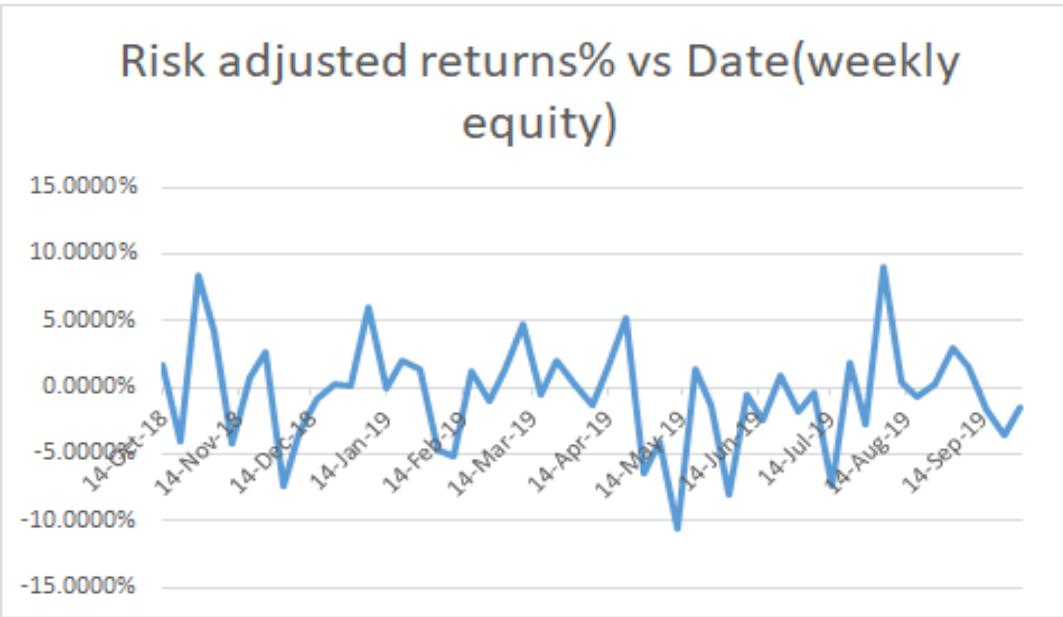
<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	-0.0906	-0.3525	-2.2472
<i>Max</i>	7.8060	9.1497	10.3239
<i>Min</i>	-7.6897	-10.3976	-17.9049
<i>Standard Deviation</i>	1.9744	3.9150	8.9077

## Adjusted Returns

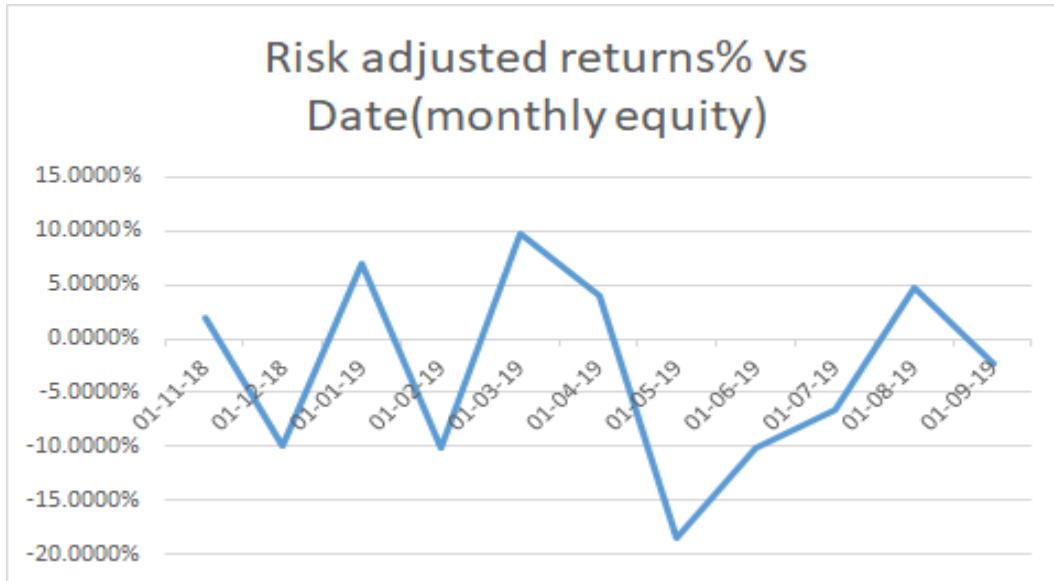
<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	-0.1078	-0.4718	-2.7590
<i>Max</i>	7.7911	9.0455	9.8139
<i>Min</i>	-7.7071	-10.5197	-18.4149
<i>Standard Deviation</i>	1.9744	3.9146	8.9078



Daily



Weekly



Monthly

## Economic Interpretation

### Risk Adjusted Return:

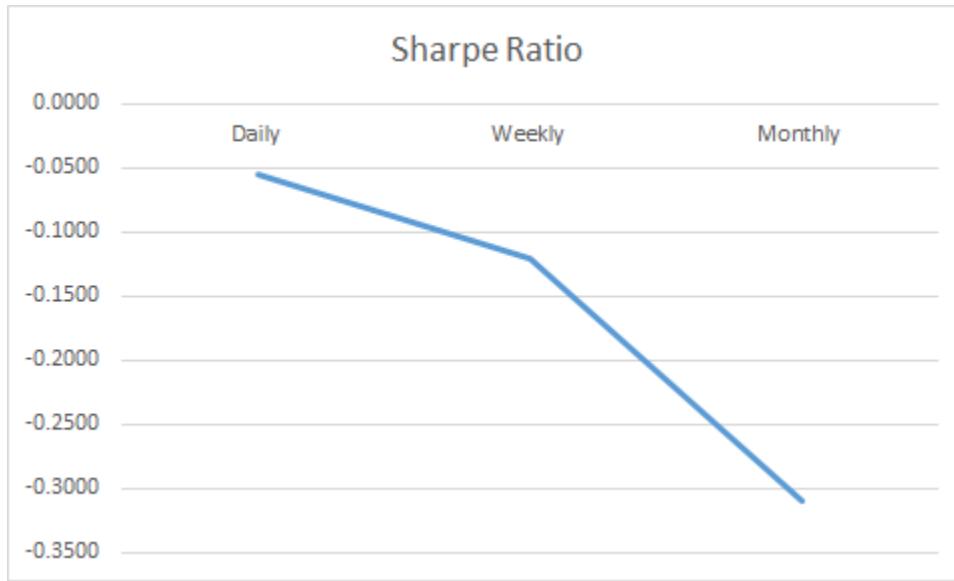
Returns calculated without accounting for Risk Free Rate do not paint a complete picture. When adjusted with risk, the return indicated whether it's worth taking the risk for the accrued return over the risk free rate. Sharpe Ratio is extensively used to express the risk adjusted return.

Sharpe Ratio =  $(\text{Unadjusted Return} - \text{Riskfree Rate}) / \text{Standard Deviation}$

The reason Risk Adjusted Return will always be less than Risk Unadjusted Return because it is more practical. It clearly shows that if the risk adjusted returns are not positive the investor might be better off investing in risk free instruments

Frequency	Sharpe Ratio
Daily	-0.0546
Weekly	-0.1205

Monthly	-0.3097
---------	---------



## Observations

- Risk Adjusted Returns and Risk Unadjusted Returns share almost the same volatility and Standard Deviation
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns

## Actions

- Monthly Returns offer lower return while the risk is higher due to the addition of time period risk. A Risk Tolerant wouldn't be recommended this stock.
- A stock such as the one presented above would be apt for day trading and not for long term investments
- However, considering that even the ultra short term returns are negative it would be better to invest in risk free instruments.

# Axis Bank

## Introduction

Axis bank is an Indian private bank headquartered in Mumbai, Maharashtra which was established in 1993 and started its operation from 1994. Axis bank holds the third largest position in the private banks sector with largest network of 4094 domestic branches across India.

### **Nature of business:**

Axis bank is the fifth largest bank which functions in the Indian banking sector. Bank is providing a wide range of services like retail banking (lending to small individuals and small business etc.), corporate banking (transaction banking, investment banking and trustee services). Axis also provides international banking services in most of the countries. Rather than 4094 domestic branches Axis has international branches in countries like Honking, Singapore, Dubai, and Colombo etc...

	<b>AXIS BANK</b>
<b>Type</b>	Private Sector Bank
<b>Traded as</b>	BSE: 532215 LSE: AXBC NSE: AXISBANK
<b>ISIN</b>	INE238A01034
<b>Industry</b>	Banking, Financial services
<b>Founded</b>	1993; 26 years ago
<b>Headquarters</b>	Mumbai, Maharashtra, India <sup>[1]</sup>
<b>Number of locations</b>	4094 branches <sup>[2]</sup> (March 2019)
<b>Area served</b>	Worldwide
<b>Key people</b>	Shri Rakesh Makhija (Chairman) <sup>[3]</sup> Amitabh Chaudhry (MD & CEO) <sup>[4]</sup>
<b>Products</b>	Retail banking, corporate banking, investment banking, mortgage loans, private banking, wealth management, credit cards, finance and insurance
<b>Revenue</b>	₹681 billion (US\$9.9 billion) (2019) <sup>[5]</sup>
<b>Operating income</b>	₹190 billion (US\$2.7 billion) (2019) <sup>[5]</sup>
<b>Net income</b>	₹46.77 billion (US\$680 million) (2019) <sup>[5]</sup>
<b>Total assets</b>	₹8.00997 trillion (US\$120 billion) (2019) <sup>[5]</sup>
<b>Number of employees</b>	61,940 (2019) <sup>[6]</sup>
<b>Website</b>	<a href="http://www.axisbank.com">www.axisbank.com</a>

[https://en.wikipedia.org/wiki/Axis\\_Bank#Indian\\_Business](https://en.wikipedia.org/wiki/Axis_Bank#Indian_Business)

Ownership:



the same year UTI started office in Shanghai, China. On 30th July 2007 UTI get named as Axis Bank.

### Industry and significance:

Axis bank holds the third largest position in private bank sector and fifth largest position in overall banking sectors of India. Bank is showing steady growth in past years with a large network of 4094 and 12922 ATMs. Axis has a second rank in India's most consumer friendly banks.

## TOP 10 BY RESPONSE TIME



ATTRIBUTE SCORED ON: "Has a quick response time (faster servicing at branches)"



<https://www.outlookindia.com/outlookmoney/archive/indias-most-customer-friendly-banks-271422>

## **Overall greatness:**

Axis Bank is a well growing bank in the Indian banking sector. Holding a fifth rank a most competing market is not a small thing. The annual results of the Bank itself show the growth. Bank could achieve an increment of 55% in total sales within five year. Main subsidiaries of Axis Bank include Axis securities Ltd., Axis private Equity Ltd. Axis achieved many awards and recognitions which includes the overall winner & consistent performer in Best Bank Awards of Business Today in 2010, Lima book of records in 2015 for creating a national record campaign ‘plant a sapling’, Best Domestic bank in India by Asia money Best Banks in 2014 etc.

<b>Annual results in brief</b>					(Rs crore)
	Mar '19	Mar '18	Mar '17	Mar '16	Mar '15
Sales	54,985.77	45,780.31	44,542.16	40,988.04	35,478.60
Operating profit	27,121.35	16,317.06	20,225.29	27,177.36	23,946.25
Interest	33,277.60	27,162.58	26,449.04	24,155.07	21,254.46
Gross profit	19,005.11	15,594.48	17,584.52	16,103.61	13,385.44
EPS (Rs)	18.19	1.07	15.36	34.51	31.04

<https://money.rediff.com/companies/Axis-Bank-Ltd/14030047/results-annual>

## Unadjusted Returns

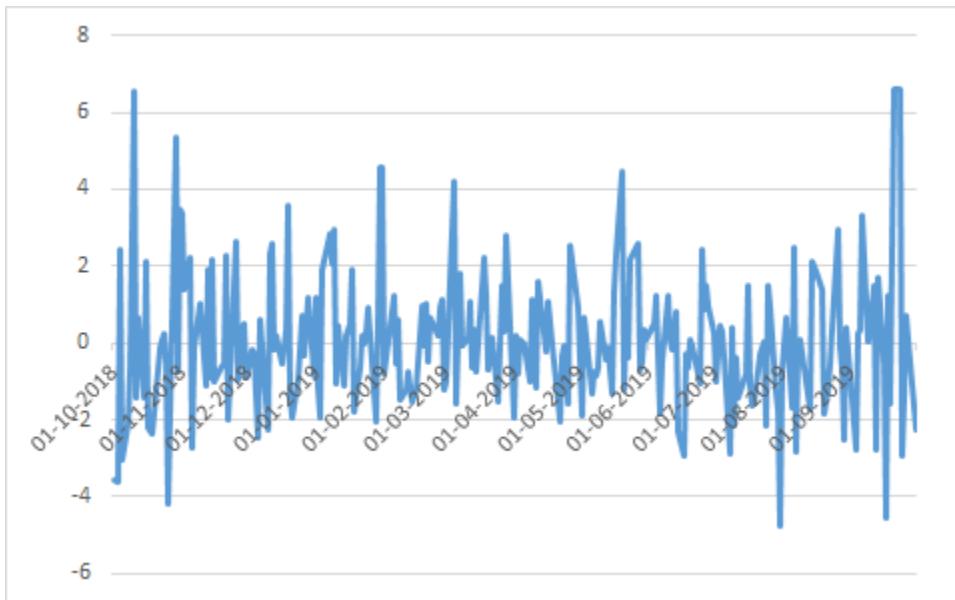
Returns	Daily	Weekly	Monthly
<b>Mean</b>	0.0608	0.2691	1.2193
<b>Max</b>	6.6362	13.567	16.583
<b>Min</b>	-4.734	-7.6728	-16.628
<b>Standard Deviation</b>	1.8238	3.6596	7.9370

## Adjusted Returns

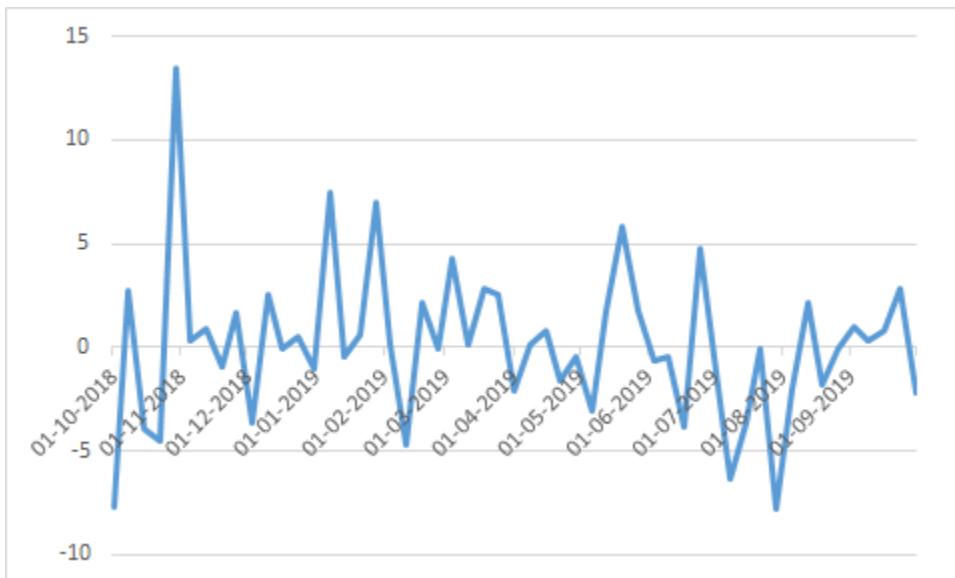
Returns	Daily	Weekly	Monthly
<b>Mean</b>	0.0436	3.6571	0.7018
<b>Max</b>	6.6214	13.443	16.034
<b>Min</b>	-4.7497	-7.7771	-17.106
<b>Standard Deviation</b>	1.8237	3.6571	7.9281

Adjusted Returns:

Daily:



Weekly:

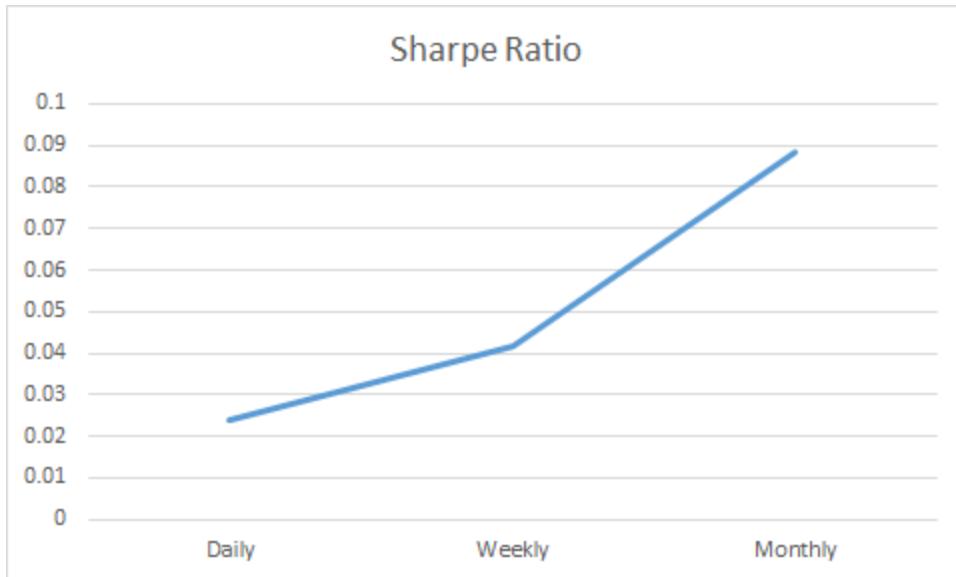


Monthly:



## Economic Interpretation

<i>Frequency</i>	<i>Sharpe Ratio</i>
Daily	0.0239
Weekly	0.0414
Monthly	0.0884



### Risk Adjusted Return:

Returns calculated without accounting for Risk Free Rate do not paint a complete picture. When adjusted with risk, the return indicated whether it's worth taking the risk for the accrued return over the risk free rate. Share Ratio is extensively used to express the risk adjusted return.

Sharpe Ratio =  $(\text{Unadjusted Return} - \text{Risk Free Rate}) / \text{Standard Deviation}$

The reason Risk Adjusted Return will always be less than Risk Unadjusted Return because it is economically more practical. It clearly shows that if the risk adjusted returns are not positive the investor might be better off investing in risk free instruments.

### Observations:

- The volatility and standard deviation is almost similar in risk unadjusted returns than in risk adjusted returns, though it is slightly greater in risk unadjusted returns. This implies market related risks affect the returns on the future instruments.
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns and unadjusted returns as volatility increase with time duration.

- The percentage of mean returns increase from daily, weekly to monthly in both risk unadjusted and risk adjusted returns, as greater returns are offered for greater risks taken.
- All the returns are positive and excess of T-bills returns.

**Action:**

- Hence, or a risk-averse investor, trading on a monthly basis gives greater returns but at the cost of greater risk taken(due to greater time period). He should implement a daily investment plan to get greater returns with lesser risk taken.
- It's rather better to follow a short term investment schedule for hedging purposes and trade daily instead of investing in longer weekly or monthly periods.

Since all returns are positive the investor can invest in this company rather than investing in T-bills for a given time period.

# State Bank of India

## Introduction



State Bank of India(SBI) is a multinational public sector bank headquartered in Mumbai,Maharashtra which was established in 1st july 1955. SBI is a government corporation statutory body which is ranked 236th in the Fortune Global 500 list of the world's biggest corporations of 2019

### Nature of Business:

SBI is one of the leading banks in India. SBI provides service not only in India but across the world. Bank is there in 36 countries with 24000+ branches. SBI plays a crucial role in maintaining currency, government's bank , bank's bank .

SBI is the bank which collects income of government like taxes and facilitate the need both of the central and state government. Basically SBI is an agent to the RBI. Since RBI have no branches SBI functions this role. other than this SBI act as a clearing house .Rather than this SBI provide basic banking facilities like loan, lending etc.

<b>Formerly</b>	Imperial Bank of India
<b>Type</b>	Public
<b>Traded as</b>	NSE: SBIN  BSE: 500112  LSE: SBID  BSE SENSEX Constituent CNX Nifty Constituent
<b>ISIN</b>	INE062A01020
<b>Industry</b>	Banking, financial services
<b>Predecessor</b>	Imperial Bank of India (1921-1955) Bank of Calcutta (1806-1921) Bank of Bombay (1840-1921) Bank of Madras (1843-1921) State Bank of Travancore (1945-2017)
<b>Founded</b>	2 June 1806, Bank of Calcutta 15 April 1840, Bank of Bombay 1 July 1843, Bank of Madras 27 January 1921, Imperial Bank of India 1 July 1955, State Bank of India
<b>Headquarters</b>	State Bank Bhawan, M.C. Road, Nariman Point, Mumbai, Maharashtra, India
<b>Number of locations</b>	22,010
<b>Area served</b>	Worldwide
<b>Key people</b>	Rajnish Kumar (Chairman)
<b>Products</b>	Retail banking, corporate banking, investment banking, mortgage loans, private banking, wealth management, credit cards, finance and insurance
<b>Revenue</b>	▲ ₹2.79644 trillion (US\$40 billion) (2019) <sup>[1]</sup>
<b>Operating income</b>	▲ ₹554.36 billion (US\$8.0 billion) (2019) <sup>[1]</sup>
<b>Net income</b>	▲ ₹8.82 billion (US\$120 million) (2019) <sup>[1]</sup>
<b>Total assets</b>	▲ ₹36,80914 trillion (US\$530 billion) (2019) <sup>[1]</sup>

[https://en.wikipedia.org/wiki/State\\_Bank\\_of\\_India#Operations](https://en.wikipedia.org/wiki/State_Bank_of_India#Operations)

## 2)ownership:

SBI is a public sector bank which have total assets of Rs.3680914 trillion. As of 30th september 2019 out of 8924611534 total number of shares 57.13% belongs to promoter holdings, institutional investors include 34.73% in which 10.69% is foreign institutional investors.

## Share holding

Share holding pattern as on :			30/09/2019	30/06/2019	31/03/2019	
Face value			1.00	1.00	1.00	
	No. Of Shares	% Holding	No. Of Shares	% Holding	No. Of Shares	% Holding
Promoter's holding						
Indian Promoters	5098882979	57.13	5098882979	57.13	5098882979	57.13
<b>Sub total</b>	<b>5098882979</b>	<b>57.13</b>	<b>5098882979</b>	<b>57.13</b>	<b>5098882979</b>	<b>57.13</b>
Non promoter's holding						
Institutional investors						
Banks Fin. Inst. and Insurance	949001915	10.63	903880589	10.13	917633864	10.28
FII's	953868887	10.69	955936362	10.71	869267969	9.74
<b>Sub total</b>	<b>3099294828</b>	<b>34.73</b>	<b>3049427318</b>	<b>34.17</b>	<b>3024421127</b>	<b>33.89</b>
Other investors						
GDR/ADR	115298950	1.29	115923960	1.30	121071350	1.36
Govt	4464707	0.05	4462517	0.05	4462517	0.05
Others	155055282	1.74	217516042	2.44	219253857	2.46
<b>Sub total</b>	<b>274818939</b>	<b>3.08</b>	<b>337902519</b>	<b>3.79</b>	<b>344787724</b>	<b>3.86</b>
General public	451614788	5.06	438398718	4.91	456519704	5.12
<b>Grand total</b>	<b>8924611534</b>	<b>100.00</b>	<b>8924611534</b>	<b>100.00</b>	<b>8924611534</b>	<b>100.00</b>

[https://money.rediff.com/companies/State-Bank-of-India/14030001/share-holding?src=comp\\_research](https://money.rediff.com/companies/State-Bank-of-India/14030001/share-holding?src=comp_research)

President of india is the only promoter holder ,holds about 57.13 % which is 5098882979 shares.

### Inception and circumstances:

The root of SBI is from 19th century. Bank of calcutta which was established on 2 june 1806 is the base root of SBI. Bank of Bengal later named as bank of Bengal. Bank of Bengal, Bank of Bombay, Bank of Madras were the three presidency Bank. These three banks has right to issue paper currency .These three banks amalgamated and reorganised to form Imperial Bank of India on 27th january 1921.Then Imperial Bank of India named as State Bank of India on 1st july 1955.

### Industry and significance:

SBI is a leading Bank which always holds 1st rank the banking sector. SBI itself has about 3 lakh employees which is about 20% of indian banking sector. Till now none of the bank could beat SBI in revenue or total asset basis. SBI is widespread not only in india but across the world.SBI itself have about 17000 branches with more than 27000 ATMs.The other notable thing of SBI is that it provides loans with the lowest interest rate. These all made SBI attractive.

#### Home Loan Interest Rates Nov 2019

SBI	8.05 - 8.95%
HDFC Ltd	8.25 - 8.75%
ICICI Bank	8.65 - 9.20%
LIC Housing	8.35 - 8.95%
DHFL	9.75%
Axis Bank	8.90% - 9.10%
Bank of Baroda	8.40% - 9.40%
Canara Bank	8.45 - 8.65%
Aadhar Housing	N.A

<https://www.deal4loans.com/loans/articles/best-indian-bank-in-overall-services/>

### Overall greatness:

SBI is a well growing Bank which could show a steady growth in sales during last 5 years. SBI got a 216 th rank the fortune global 500 ranking. This ranking itself is

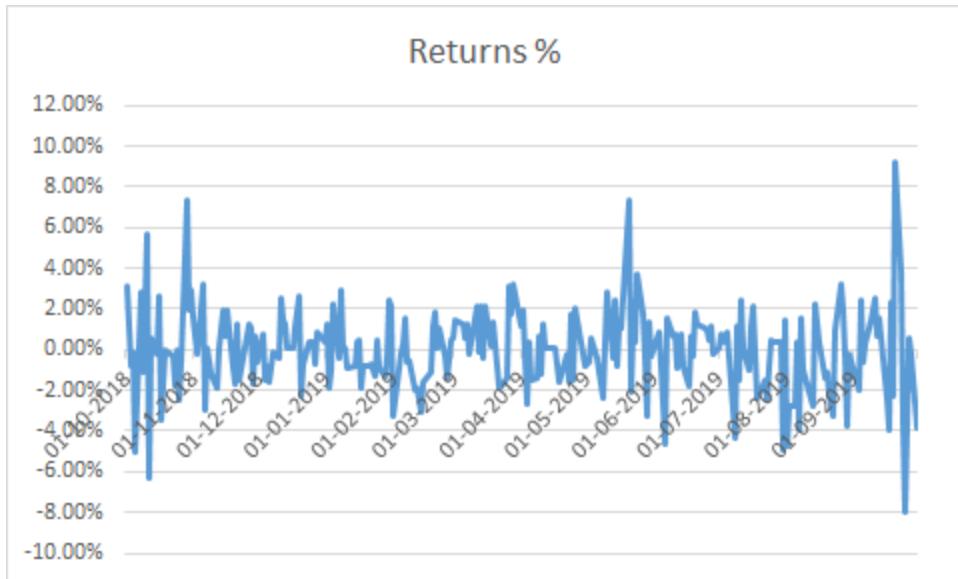
enough to calculate the greatness of SBI. SBI is one of the trustable Banks of India. By the Brand Trust Report of 2013 SBI was the 19th most trustable Bank in India. But As per the Bank Trust Report of 2014 SBI could gain 19th position in the trustable bank list. The annual sales report shown below shows the growth of SBI.

<b>Annual results in brief</b>					(Rs crore)
	Mar '19	Mar '18	Mar '17	Mar '16	Mar '15
Sales	2,42,868.65	2,20,499.31	1,75,518.24	1,63,998.30	1,52,397.07
Operating profit	1,19,352.37	85,516.67	93,052.73	92,732.18	94,119.89
Interest	1,54,519.78	1,45,645.60	1,13,658.50	1,06,803.49	97,381.82
Gross profit	53,875.48	54,074.78	50,847.90	43,257.81	38,913.50
EPS (Rs)	0.97	-7.34	13.15	12.82	17.55

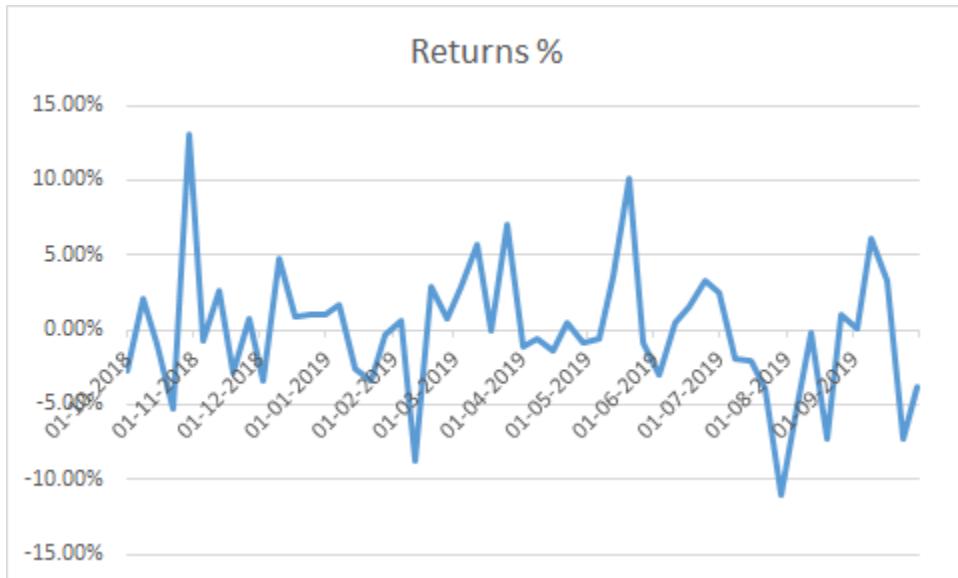
<https://money.rediff.com/companies/State-Bank-of-India/14030001/results-annual>

## Unadjusted Returns

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.0135%	-0.0533%	-0.2524%
<b>Max</b>	9.1467%	13.0541%	16.1185%
<b>Min</b>	-7.9750%	-11.0715%	-21.3073%
<b>Standard Deviation</b>	0.0209	0.0430	0.0995



Daily



Weekly



Monthly

## Adjusted Returns

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.0135%	-0.1706%	-0.7698%
<b>Max</b>	9.1647%	12.9205%	15.6085%
<b>Min</b>	-7.9750%	-11.1757%	-21.7590%
<b>Standard Deviation</b>	0.0209	0.0430	0.0993

## Economic Interpretation

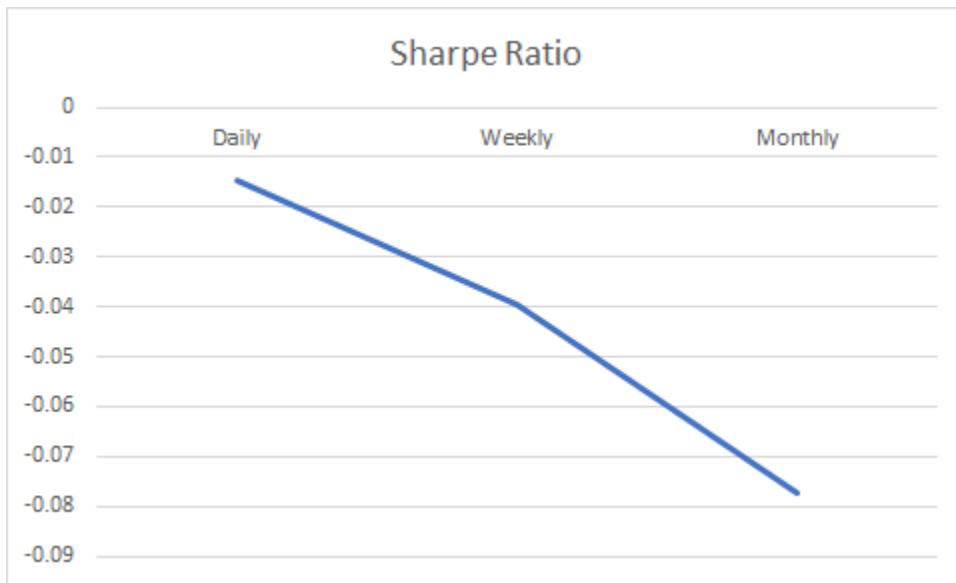
### Risk Adjusted Return:

Returns calculated without accounting for Risk Free Rate do not paint a complete picture. When adjusted with risk, the return indicated whether it's worth taking the risk for the accrued return over the risk free rate. Share Ratio is extensively used to express the risk adjusted return.

Sharpe Ratio =  $(\text{Unadjusted Return} - \text{Riskfree Rate}) / \text{Standard Deviation}$

The reason Risk Adjusted Return will always be less than Risk Unadjusted Return because it is economically more practical. It clearly shows that if the risk adjusted returns are not positive the investor might be better off investing in risk free instruments.

<i>Frequency</i>	<i>Sharpe Ratio</i>
Daily	-0.0145
Weekly	-0.0396
Monthly	-0.0773



## Observations

- Risk Adjusted Returns and Risk Unadjusted Returns share almost the same volatility and Standard Deviation
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns

## Actions

- Monthly Returns offer lower return while the risk is higher due to the addition of time period risk. A Risk Tolerant wouldn't be recommended this stock.
- A stock such as the one presented above would be apt for day trading and not for long term investments
- However, considering that even the ultra short term returns are negative it would be better to invest in risk free instruments

# Steel Authority of India

## Introduction



Steel Authority of India is a public sector undertaking which produces steels .Company was established in 19th January 1954 headquartered in New Delhi. The annual turnover of the company is about Rs.66267 crore. Government of India takes the role of operating company. In the steel producing sector SAIL is the 3rd largest company in India.

### 1) Nature of Business:

SAIL produces and markets steels across the world. SAIL has 20th rank in the steel producing company across the world. Company owns about five steel plants at Bhilai, Rourkela, Bokaro, Durgapur, Asansol. Besides this company owns three special plants in Durgapur, Salem, Bhadravathi. SAIL manufactures a wide range of products which include both long and flat. Long products consist of crane rails, bars, rods and rebars and wire rods. Flat products include

plates, CR coils and sheets, sheets and skelp, GC sheets and coils. they also produces pig iron in a wide range.



**सेल SAIL**

<b>Native name</b>	Hindustan Steel Limited
<b>Type</b>	(Central Govt. Organisation) Public Sector Undertakings in India
<b>Traded as</b>	NSE: SAIL BSE: 500113 LSE: SAUD
<b>Industry</b>	Steel
<b>Founded</b>	19 January 1954; 65 years ago
<b>Headquarters</b>	New Delhi, India
<b>Key people</b>	Anil Kumar Chaudhary (Chairman) <sup>[1]</sup>
<b>Products</b>	Steel, flat steel products, long steel products, wire products, Wheel & axle for Indian railways, plates
<b>Revenue</b>	▲ ₹67,468 crore (US\$9.8 billion) (2019) <sup>[2]</sup>
<b>Operating income</b>	▲ ₹3,715 crore (US\$540 million) (2019) <sup>[2]</sup>
<b>Net income</b>	▲ ₹2,703 crore (US\$390 million) (2019) <sup>[2]</sup>
<b>Total assets</b>	▲ ₹79,585 crore (US\$12 billion) (2019) <sup>[2]</sup>
<b>Owner</b>	Indian Government (74.9%)
<b>Number of employees</b>	71,297 (1 Aug 2019)
<b>Website</b>	<a href="http://www.sail.co.in">www.sail.co.in</a>

[https://en.wikipedia.org/wiki/Steel\\_Authority\\_of\\_India](https://en.wikipedia.org/wiki/Steel_Authority_of_India)

## 2)Ownership:

Ownership of SAIL belongs to Government of India. About 75% of SAIL equity is along with Government of India itself. Mr Anil Kumar Chaudhery is the present chairman who was succeeded by Mr. Saraswati Prasad. As of 30

September 2019 out of 4130525289 total shares 3097767449 shares are with Indian promoters. Institutional investors own 18.12% of total shares. Foreign institutional investors own 3.74%. Only 4.92% of total shares is owned by public.

### Share holding

Share holding pattern as on :			30/09/2019	30/06/2019	31/03/2019	
	No. Of Shares	% Holding	No. Of Shares	% Holding	No. Of Shares	% Holding
Promoter's holding						
Indian Promoters	3097767449	75.00	3097767449	74.99	3097767449	75.00
<b>Sub total</b>	<b>3097767449</b>	<b>75.00</b>	<b>3097767449</b>	<b>74.99</b>	<b>3097767449</b>	<b>75.00</b>
Non promoter's holding						
Institutional investors						
Banks Fin. Inst. and Insurance	453583969	10.98	462839919	11.21	489546154	11.85
FII's	154386444	3.74	160022585	3.87	169385488	4.10
<b>Sub total</b>	<b>748368449</b>	<b>18.12</b>	<b>793772356</b>	<b>19.22</b>	<b>784910626</b>	<b>19.00</b>
Other investors						
GDR/ADR	110990	-	232870	0.01	116435	-
Govt	2180454	0.05	2182554	0.05	1961727	0.05
Others	78872105	1.91	68472498	1.66	80572928	1.95
<b>Sub total</b>	<b>81163549</b>	<b>1.96</b>	<b>70887922</b>	<b>1.72</b>	<b>82651090</b>	<b>2.00</b>
General public	203225842	4.92	168213997	4.07	165196124	4.00
<b>Grand total</b>	<b>4130525289</b>	<b>100.00</b>	<b>4130641724</b>	<b>100.00</b>	<b>4130525289</b>	<b>100.00</b>

[https://money.rediff.com/companies/Steel-Authority-of-India-SAIL-Ltd/15510002/share-holding?src=comp\\_research](https://money.rediff.com/companies/Steel-Authority-of-India-SAIL-Ltd/15510002/share-holding?src=comp_research)

### **3)Inception and circumstances:**

SAIL was established in New Delhi on 19 january 1954. Origin of SAIL is from Hindustan Steel Limited(HSL).At the beginning was a plan to manage upcoming steel plant in Rourkela.But from april 1957 HSL got control over two steel plants of Bhilai and Durgapur.Bokaro steel limited, a new steel company incorporated with HSL on 29th january 1964 for the operation of Bokaro steel plant. At the end of 1972 company could show a mass performance by producing 4MT steel.

### **4)Industry and significance:**

Steel Authority of India is a large steel manufacturing company with a greatest annual turnover of INR 66267crore(during 2018–2019).Company is producing more than 16 million metric tons of steel in a year.Company is in a well growing stage and planing to expand production to 50MT per annum by 2025. SAIL is one of the seven maharatnas of Indian public sector enterprises .Research and Development Centre for Iron and Steel(RDCIS) at Ranchi made SIAL a leading company by producing quality steels and helps for innovations in steel production. Increment in the annual sales of last years itself shows the growth of company .

Annual results in brief					(Rs crore)
	Mar '19	Mar '18	Mar '17	Mar '16	Mar '15
Sales	66,967.31	57,558.46	44,452.41	39,051.88	45,710.78
Operating profit	9,734.11	4,617.85	38.04	-2,899.37	4,602.68
Interest	3,154.92	2,822.75	2,527.82	2,300.45	1,454.23
Gross profit	7,112.01	2,279.55	-1,954.17	-4,605.15	4,132.19
EPS (Rs)	5.27	-1.17	-6.86	-9.74	5.11

<https://money.rediff.com/companies/Steel-Authority-of-India-SAIL-Ltd/15510002/results-annual>

### **5)Overall Greatness:**

The great performance and steady growth made SAIL a leading company among many competitors. This made company to achieve many awards and recognitions. SAIL owns “Best of all” Rajiv Gandhi National Quality Award in 1993,2006,2007.SAIL get listed in Forbes Global 2000 companies .Among these 2000 world wide companies SAIL get listed with 647 position. In 2011 SAIL got Golden Peacock Environment Management Award and Maiden Wockhardt Shining Star CSR Award in the iron and steel category.



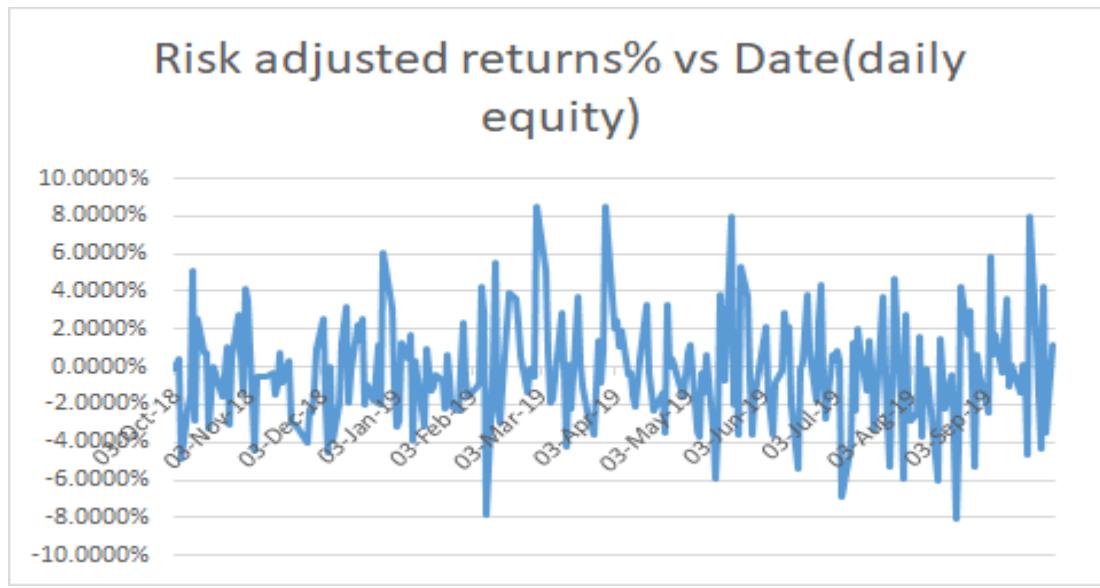
### **Unadjusted Returns**

Returns	Daily	Weekly	Monthly
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<b>Mean</b>	-0.2551	-1.1762	-4.8916
<b>Max</b>	8.5799	10.2326	11.3990
<b>Min</b>	-8.0808	-13.3978	-27.0175
<b>Standard Deviation</b>	2.8225	5.1920	12.3726

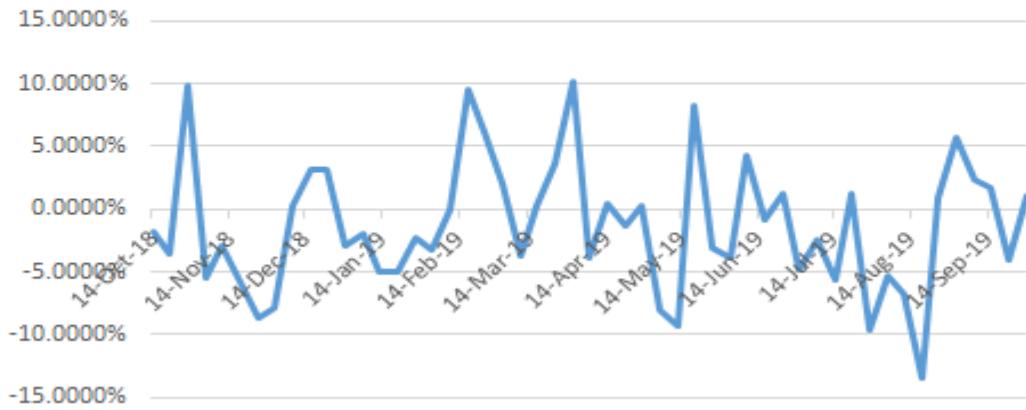
## Adjusted Returns

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.2722	-1.2963	-5.4034
<b>Max</b>	8.5631	10.11322	10.8890
<b>Min</b>	-8.0957	-13.5024	-27.4692
<b>Standard Deviation</b>	2.8225	5.1922	12.3690



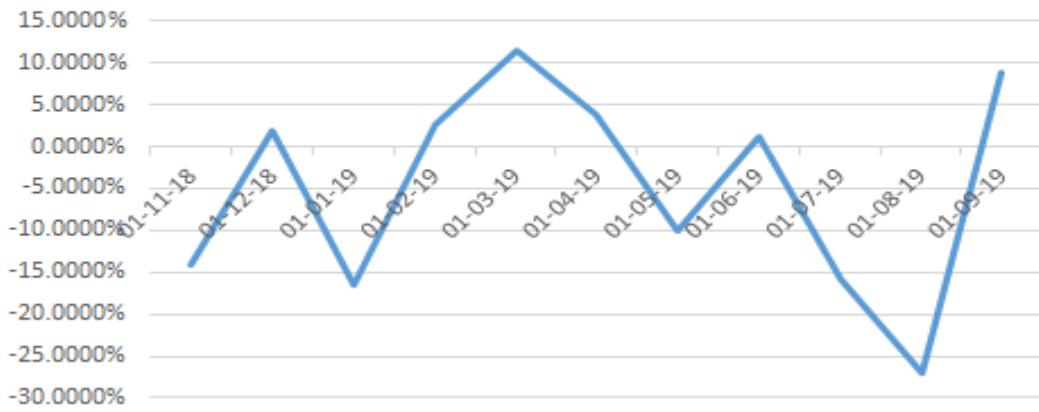
Daily

### Risk adjusted returns% vs Date(weekly equity)



Weekly

### Risk unadjusted returns% vs Date(monthly equity)



Monthly

## Economic Interpretation

### Risk Adjusted Return:

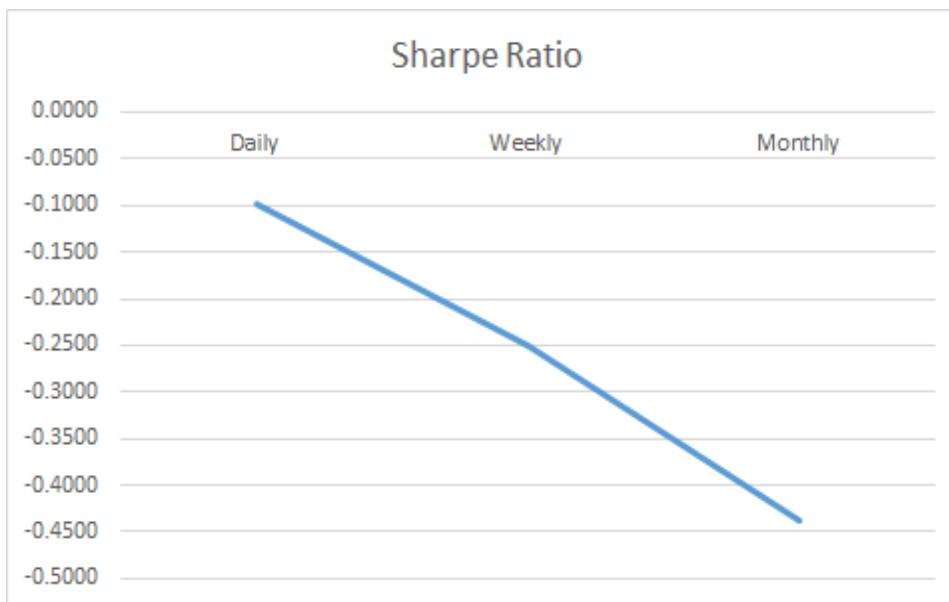
Returns calculated without accounting for Risk Free Rate do not paint a complete picture. When adjusted with risk, the return indicated whether it's worth taking the

risk for the accrued return over the risk free rate. Share Ratio is extensively used to express the risk adjusted return.

Sharpe Ratio =  $(\text{Unadjusted Return} - \text{Riskfree Rate}) / \text{Standard Deviation}$

The reason Risk Adjusted Return will always be less than Risk Unadjusted Return because it is economically more practical. It clearly shows that if the risk adjusted returns are not positive the investor might be better off investing in risk free instruments.

<i>Frequency</i>	<i>Sharpe Ratio</i>
Daily	-0.0986
Weekly	-0.2496
Monthly	-0.4368



## Observations

- Risk Adjusted Returns and Risk Unadjusted Returns share almost the same volatility and Standard Deviation
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns

## Actions

- Monthly Returns offer lower return while the risk is higher due to the addition of time period risk. A Risk Tolerant wouldn't be recommended this stock.
- A stock such as the one presented above would be apt for day trading and not for long term investments
- However, considering that even the ultra short term returns are negative it would be better to invest in risk free instruments

# Equity Futures Instrument:

The contract specifications mentioned below are the same for all contracts.

Daily settlement price	Last half hour's weighted average price
Final settlement price	closing price of underlying equity on the last trading day of the contract
Price Steps	0.05
Price Bands	Operating range of 20% of the base price
Trading Cycle	3 months – Near, Middle, Next

<b>Price Steps</b>	0.05
<b>Price Bands</b>	Operating range of 10% of the base price
<b>Trading Cycle</b>	3 months – Near, Middle, Next
<b>Trading hours</b>	As in equity derivative segment
<b>Expiry date</b>	Last Thursday of expiry month
<b>Daily settlement price</b>	Last half hour's weighted average price
<b>Final settlement price</b>	closing price of underlying equity on the last trading day of the contract

## General Greatness of Futures

Liquidity of the underlying asset can be increased by opting for futures. This is because the information spreads quickly and even in inefficient markets, the price quickly reflects the new information. This results in an increase in trading volumes, decrease in volatility and thus higher sharpe ratio



# Apollo Tyres

## Introduction

<i>Items</i>	<i>Value</i>
<i>Date of Issue</i>	4/01/2002
<i>Lot Size</i>	3000

## Returns

*Risk Unadjusted*

*Near*

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	-0.0427%	-0.3757%	-2.4078%
<i>Max</i>	6.4378%	8.9984%	7.6831%
<i>Min</i>	-6.0606%	-10.5236%	-27.5484%
<i>Standard Deviation</i>	2.1286%	4.4866%	10.2874%

*Middle*

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>

<b>Mean</b>	-0.0485%	-0.4209%	-2.4563%
<b>Max</b>	6.6899%	8.9487%	6.7302%
<b>Min</b>	-6.1064%	-10.4346%	-26.5398%
<b>Standard Deviation</b>	2.1438%	4.3844%	10.0561%

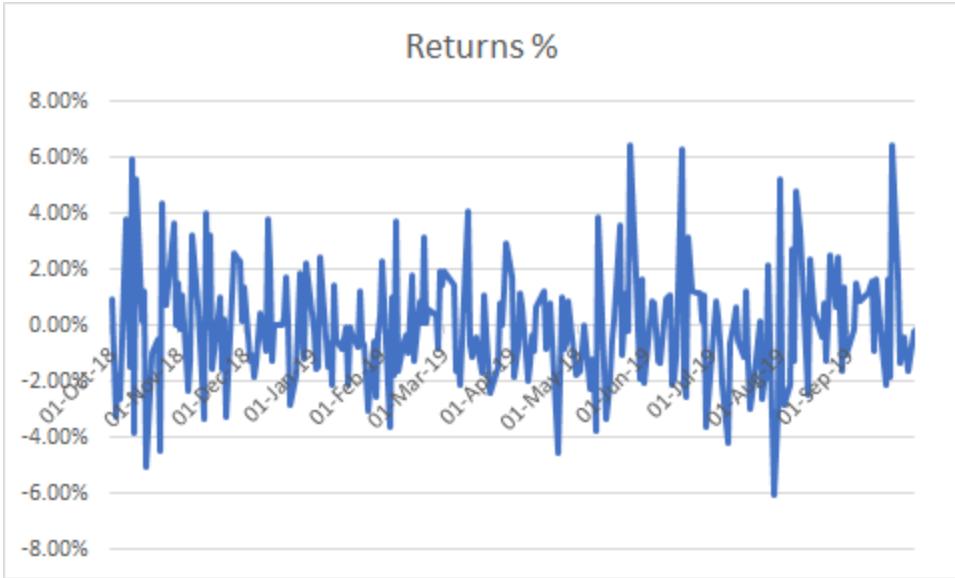
**Far**

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.0846%	-0.4995%	-2.9712%
<b>Max</b>	7.0588%	7.6923%	12.1486%
<b>Min</b>	-10.1193%	-15.3700%	-19.6021%
<b>Standard Deviation</b>	2.2746%	4.8350%	0.0825

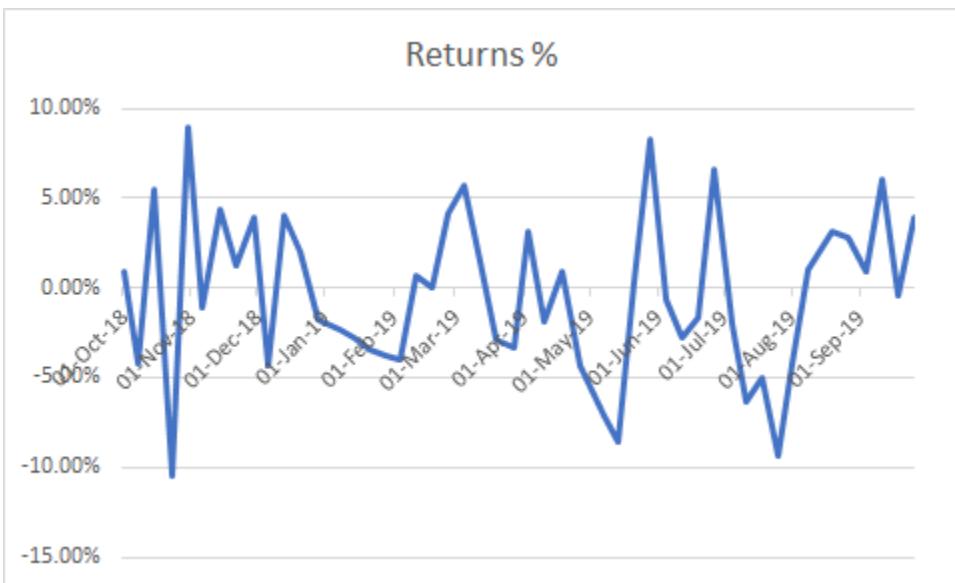
**Risk Adjusted**

**Near**

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.0598%	-0.4964%	10.2737%
<b>Max</b>	6.4232%	8.8647%	-2.9253%
<b>Min</b>	-6.0763%	-10.6575%	7.2381%
<b>Standard Deviation</b>	2.1287%	4.4870%	-28.0001%



*Daily*



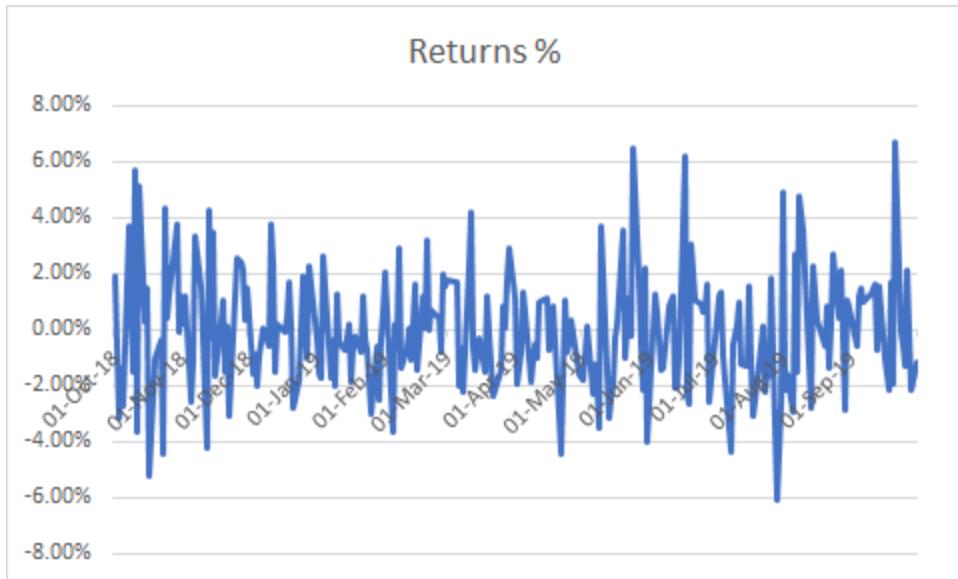
*Weekly*



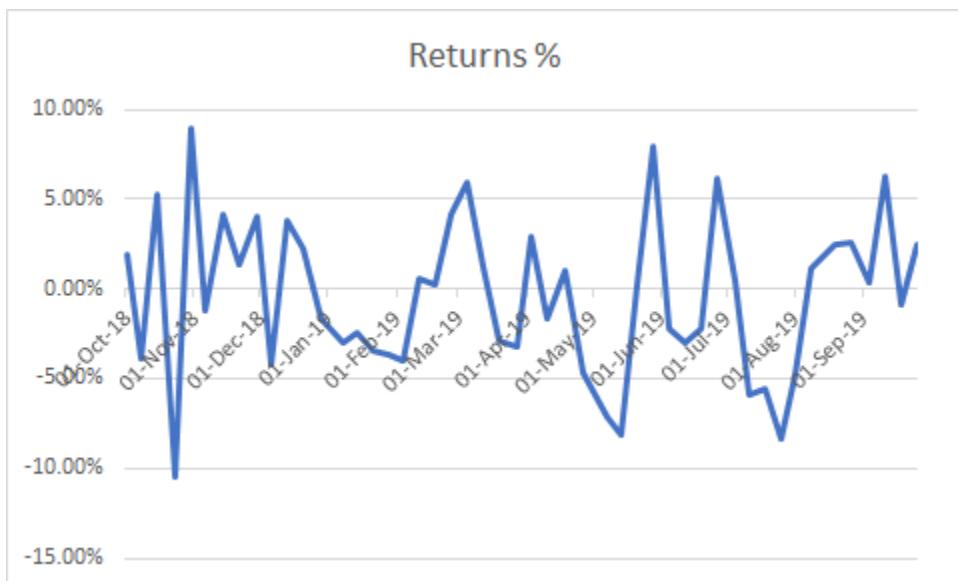
*Monthly*

*Middle*

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.0656%	-0.5416%	-2.9738%
<b>Max</b>	6.6754%	8.8150%	6.1743%
<b>Min</b>	-6.1221%	-10.5684%	-26.9915%
<b>Standard Deviation</b>	2.1438%	4.3845%	10.0412%



*Daily*



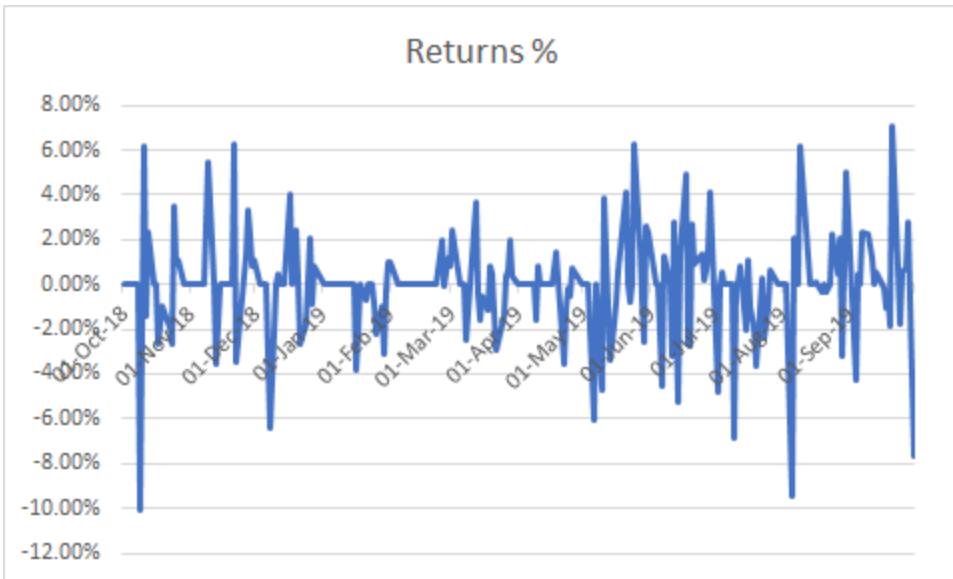
*Weekly*



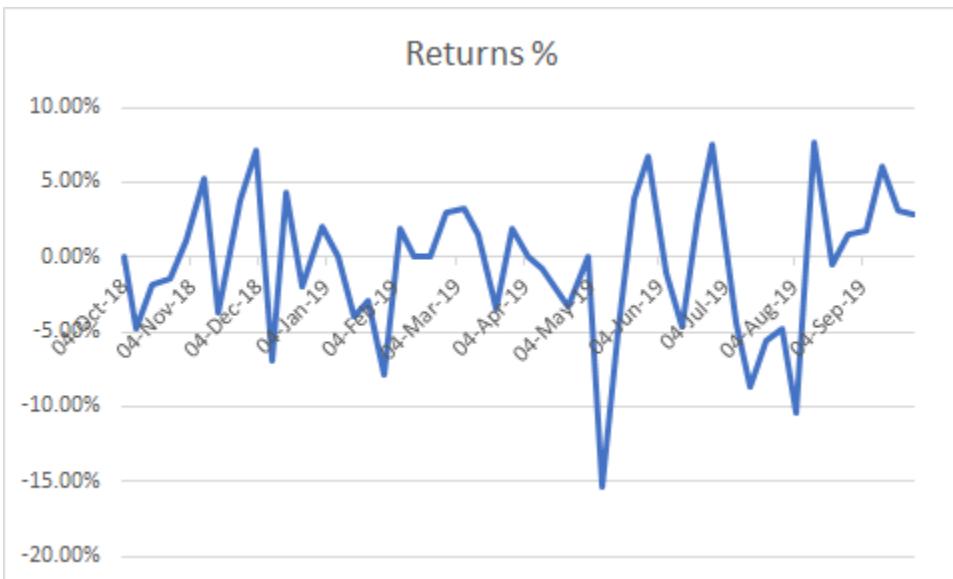
*Monthly*

*Far*

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.1017%	-0.6201%	-3.49%
<b>Max</b>	7.0442%	7.5837%	11.59%
<b>Min</b>	-10.1381%	-15.4944%	-20.05%
<b>Standard Deviation</b>	2.2746%	4.8360%	0.082428



*Daily*



*Weekly*



*Monthly*

## Economic Interpretation

### Observations:

- The risk adjusted returns are not higher than risk unadjusted returns, since to adjust for risk, risk-free rate is deducted from the returns
- As expected, there is no difference in the volatility and standard deviation of unadjusted returns and risk adjusted returns.
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns.
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns
- Trend observed in Returns: Middle>Near>Far

### Action

- Risk Averse and Risk Tolerant should invest in middle month derivatives to achieve higher return with comparatively lesser risk than far month derivatives
- A hedging investor should follow middle month schedule, thereby earning more returns at comparatively less risk.
- However, considering that even the ultra-short-term returns are negative it would be better to invest in risk free instruments

## Arvind:

### Important note:

<https://www.thehindubusinessline.com/markets/idbi-bank-arvind-mcx-and-six-others-excluded-from-fo/article28654625.ece>

It was excluded from F&O trades recently. Hence we are unable to find the contracts related data for the company on NSE or other trade related websites.

From that day the futures were introduced for the company's underlying, the trading volume of the futures of the company was growing at a very high rate.

Futures trading volume is more than trading in the corresponding underlying.

### Introduction

<i>Items</i>	<i>Value</i>
<i>Date of Issue</i>	N.A.
<i>Lot Size</i>	N.A.

### Returns

#### *Risk Unadjusted*

#### *Near*

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	-0.5736	-2.4845	-12.4651
<i>Max</i>	10.6481	13.4082	10.6993
<i>Min</i>	-65.0378	-66.6667	-70.3736

<b>Standard Deviation</b>	5.1160	10.7753	20.9889
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**Middle**

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.6301	-2.9817	-12.0551
<b>Max</b>	10.5851	13.5616	9.8692
<b>Min</b>	-65.0378	-66.5910	-70.3127
<b>Standard Deviation</b>	5.3119	10.8162	21.8833

**Far**

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.6206	-2.9090	-11.7408
<b>Max</b>	10.9436	13.7615	10.5729
<b>Min</b>	-64.4752	-66.2390	-70.4688
<b>Standard Deviation</b>	5.3609	11.3351	23.4351

## *Risk Adjusted*

### *Near*

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.5907	-2.6042	-12.9769
<b>Max</b>	10.6306	13.2867	10.1660
<b>Min</b>	-65.0563	-66.7951	-70.9294
<b>Standard Deviation</b>	5.1160	10.7763	20.9906

### Daily



### Weekly



Monthly

**Middle**

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.6474	-3.1025	-12.5736
<b>Max</b>	10.5676	13.4400	9.3359
<b>Min</b>	-65.0563	-66.7194	-70.8686
<b>Standard Deviation</b>	5.3120	10.8166	21.8876

Daily



weekly



Monthly

*Far*

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.6382	-3.0317	-12.2667
<b>Max</b>	10.9261	13.6399	10.0396

<b>Min</b>	-64.4937	-66.3675	-71.0246
<b>Standard Deviation</b>	5.3610	11.3356	23.4396

Daily



Weekly



Monthly

## Economic Interpretation

### Observations:

- The risk adjusted returns are not higher than risk unadjusted returns, since to adjust for risk, risk-free rate is deducted from the returns
  - As expected, there is no difference in the volatility and standard deviation of unadjusted returns and risk adjusted returns.
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns.
  - Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns
- Trend observed in Returns:Near> Middle>Far

### Action

- Risk Averse and Risk Tolerant should invest in near month derivatives to achieve higher return with comparatively lesser risk than far month derivatives
  - A hedging investor should follow near month schedule, thereby earning more returns at comparatively less risk.
- However, considering that even the ultra-short term returns are negative it would be better to invest in risk free instruments

# Ashok Leyland

## Introduction

Items	Value
Date of Issue	5 july 2002
Lot Size	600

## Returns

*Risk Unadjusted*

*Near*

Returns	Daily	Weekly	Monthly
Mean	-0.1808	-0.9486	-4.6204
Max	18.6648	19.324	13.1276
Min	-10.6695	-10.383	-24.040
Standard Deviation	2.8342	5.8744	9.2490

*Middle*

Returns	Daily	Weekly	Monthly
Mean	-0.1853	-0.9718	-4.712

<b>Max</b>	18.468	-10.457	13.397
<b>Min</b>	-10.6162	18.449	-23.9858
<b>Standard Deviation</b>	2.8348	5.8274	8.9967

*Far*

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.1828	-0.9586	-4.7281
<b>Max</b>	18.5750	19.0667	13.6857
<b>Min</b>	-10.9549	-10.9504	-24.4302
<b>Standard Deviation</b>	2.8374	5.8495	9.1893

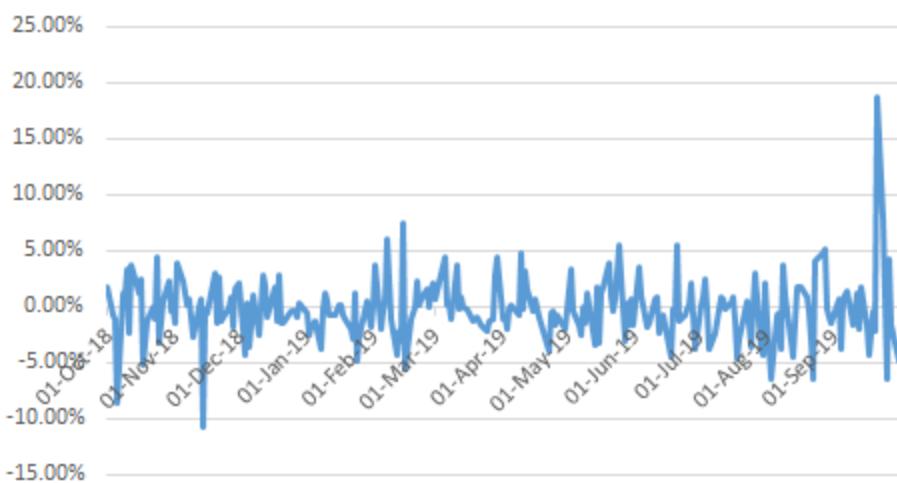
*Risk Adjusted*

*Near*

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.2025	-1.0671	-5.1372
<b>Max</b>	18.6534	19.2248	12.6171
<b>Min</b>	-10.6923	-10.493	-24.4913
<b>Standard Deviation</b>	2.83	5.8745	9.2405

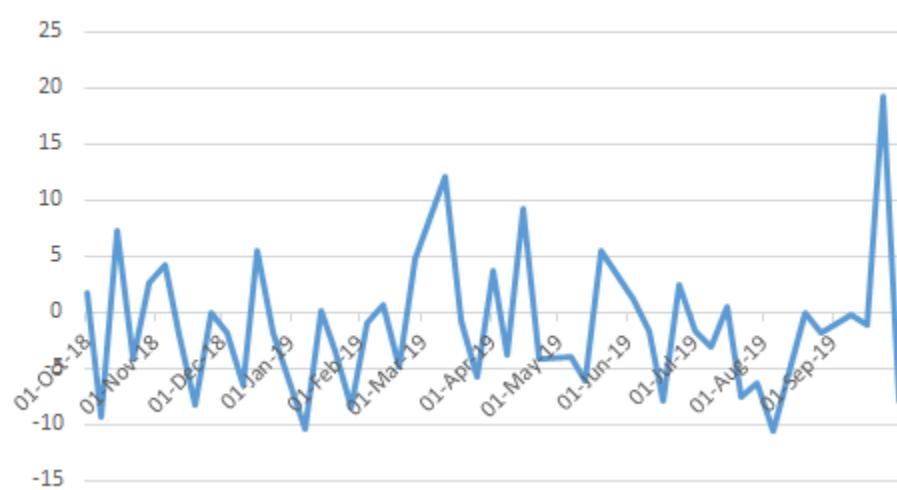
Daily:

### Adjusted Returns % vs Date

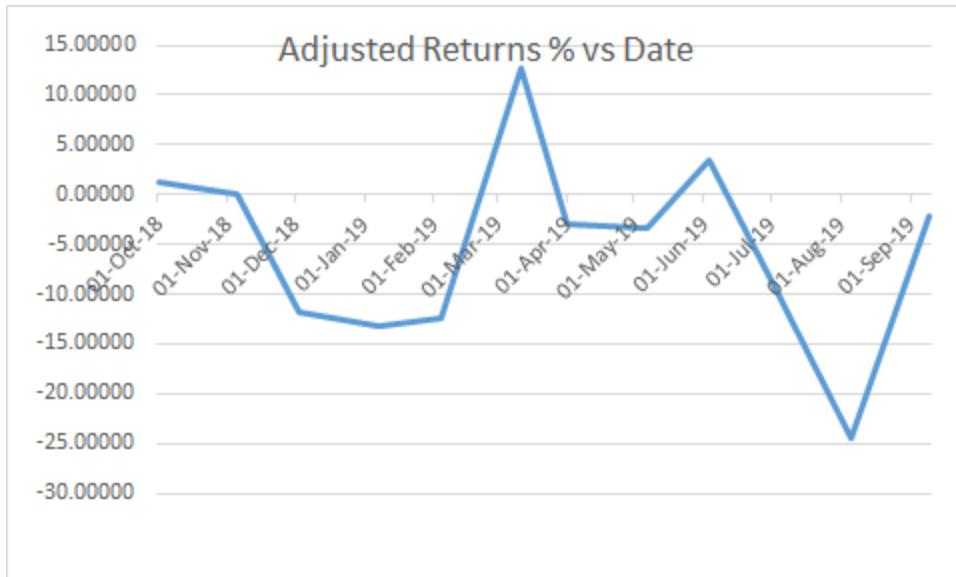


Weekly:

### Adjusted Return % vs Date



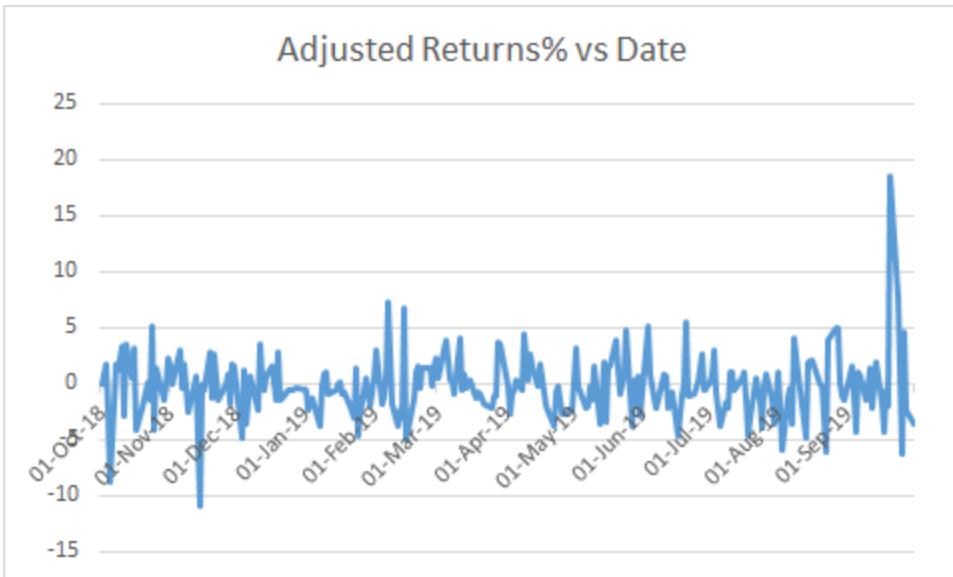
Monthly:



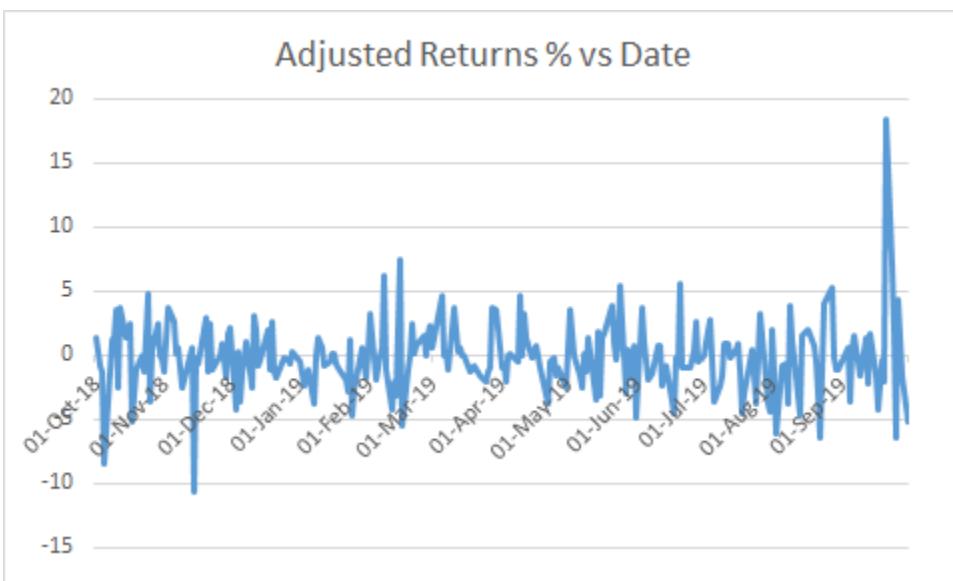
## Middle

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.2023	-1.0921	-5.2292
<b>Max</b>	18.4534	18.3374	12.6174
<b>Min</b>	-10.6432	-10.5673	-24.4911
<b>Standard Deviation</b>	2.8342	5.8273	9.24052

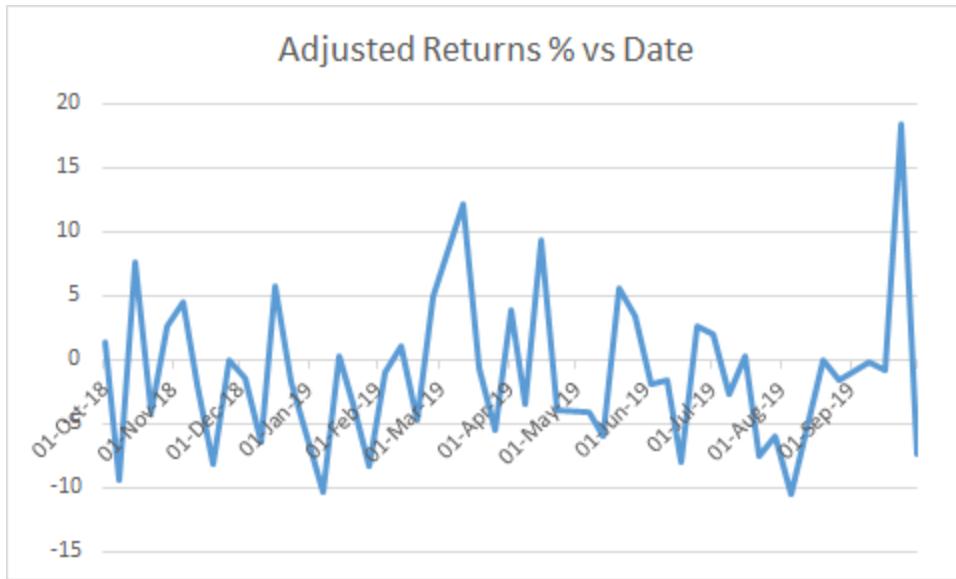
Daily:



Weekly:



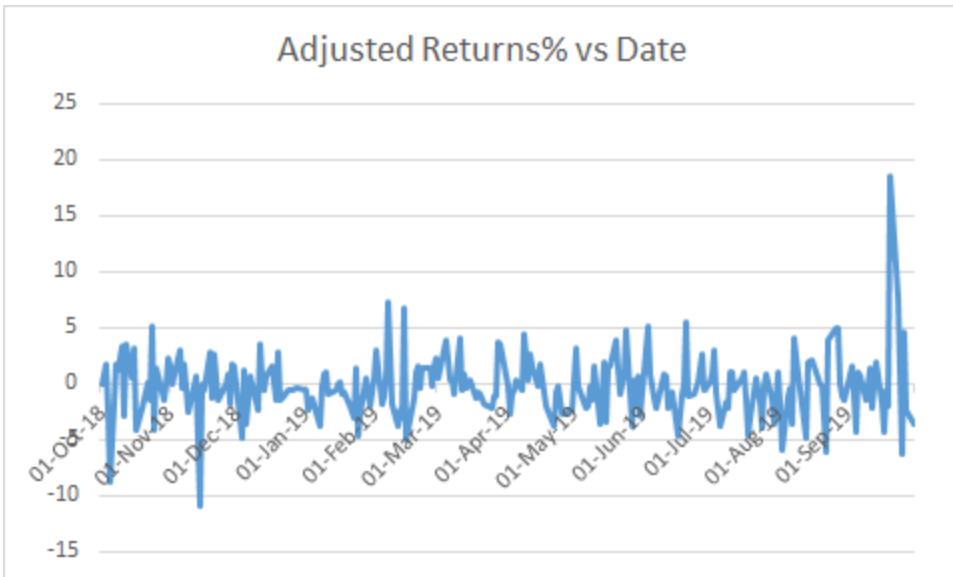
Monthly:



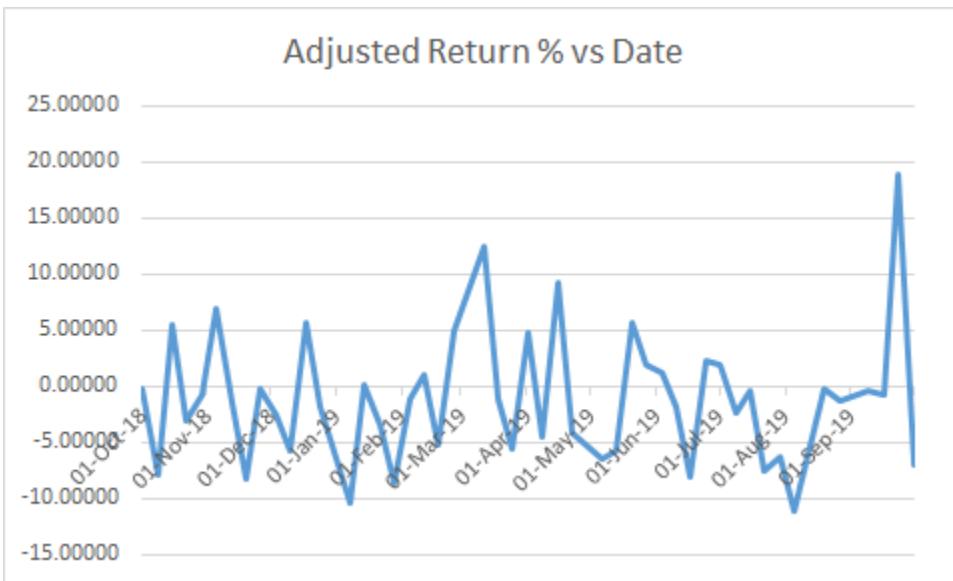
*Far*

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.1998	-1.0723	-5.2453
<b>Max</b>	18.5602	18.9621	13.1751
<b>Min</b>	-10.9733	-11.0684	-24.8823
<b>Standard Deviation</b>	2.8376	5.8493	9.1893

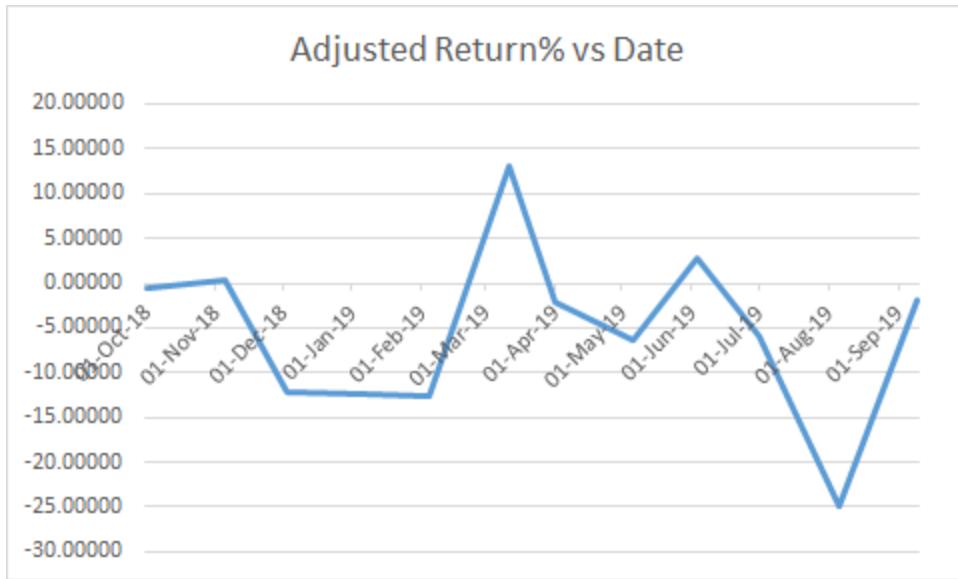
Daily:



Weekly:



Monthly:



## Economic Interpretation

## Economic Interpretation

### Observations:

- The risk adjusted returns are not higher than risk unadjusted returns, since to adjust for risk, risk-free rate is deducted from the returns
- As expected, there is no difference in the volatility and standard deviation of unadjusted returns and risk adjusted returns.
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns.
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns
- Trend observed in Returns: Far > Middle > near

### Action

- Risk Averse and Risk Tolerant should invest in Far month derivatives to achieve higher return with comparatively lesser risk than far month derivatives
- A hedging investor should follow Far month schedule, thereby earning more returns at comparatively less risk.
- However, considering that even the ultra-short term returns are negative it would be better to invest in risk free instruments

## Asian Paints:

### Introduction

**The Asians Paints Ltd Futures Trading commenced from July 5th, 2002**

From that day, the trading volume of the futures of the company was growing at a very high rate.

Futures trading is more than trading in the corresponding underlying.

### Contract Specifications

The contract specifications for the futures contracts are given below. As it is a derivative from equity, there is no physical delivery location. The **lot size is fixed as 600 shares per lot**. Therefore, it is not **much lucrative or affordable** in perspective of **small, individual traders** who want to trade in smaller lot sizes. However big investment traders (investment banks, high net worth investors etc.) can find it **relatively easy to trade with the lot size being only 600 which is still relatively less than other futures stocks of the peer groups**.

Symbol	ASIANPAINT
Lot size	600

### Returns

#### *Risk Unadjusted*

#### *Near*

Returns	Daily	Weekly	Monthly
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<b>Mean</b>	0.1444%	0.5654%	1.6805%
<b>Max</b>	8.0221%	15.1590%	11.0004%
<b>Min</b>	-4.5088%	-6.2859%	-7.1539%
<b>Standard Deviation</b>	1.5839%	3.6493%	5.8886%

### Middle

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	0.1395%	0.5656%	1.5230%
<b>Max</b>	8.8951%	15.2288%	9.6379%
<b>Min</b>	-4.1385%	-6.2667%	-6.5978%
<b>Standard Deviation</b>	1.6080%	3.6627%	5.6840%

### Far

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	0.1409%	0.5312%	1.6805%
<b>Max</b>	8.1094%	15.6896%	11.0004%
<b>Min</b>	-13.1925%	-7.2404%	-7.1539%

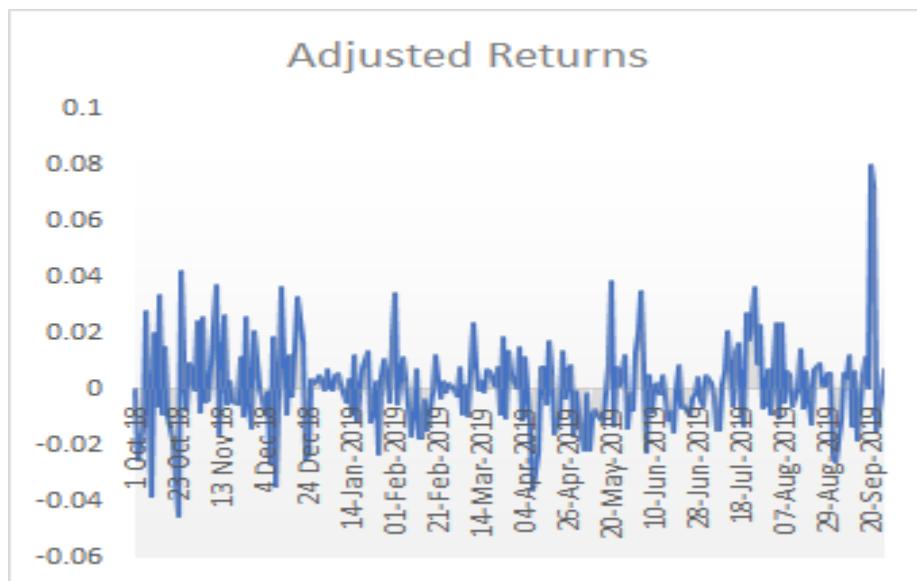
<b>Standard Deviation</b>	0.1667%	3.8835%	5.8968%
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### *Risk Adjusted*

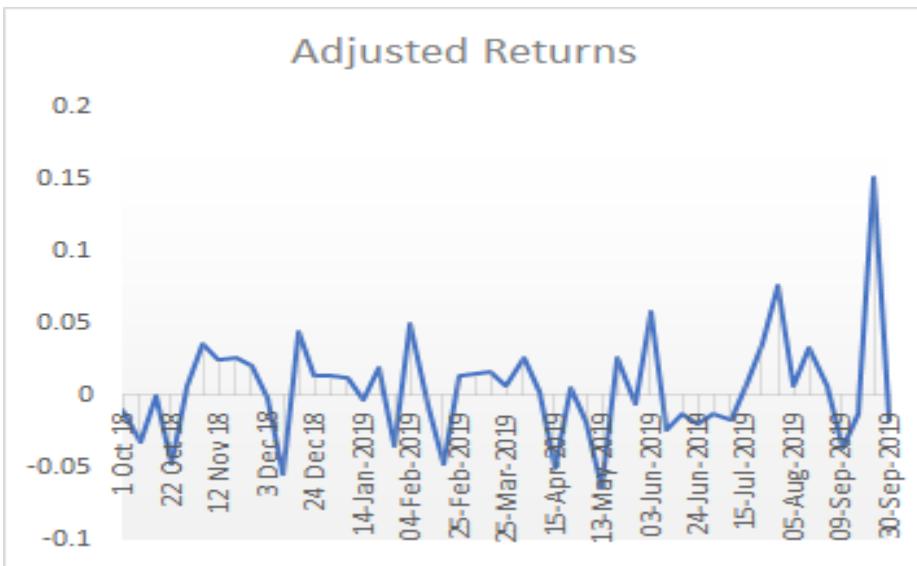
*Near*

Returns	Daily	Weekly	Monthly
<b>Mean</b>	0.1267019218	0.4447%	1.1630%
<b>Max</b>	8.022147824	15.0567%	10.4446%
<b>Min</b>	-4.527952167	-6.4097%	-7.7164%
<b>Standard Deviation</b>	6.344405416	3.6513%	5.8968%

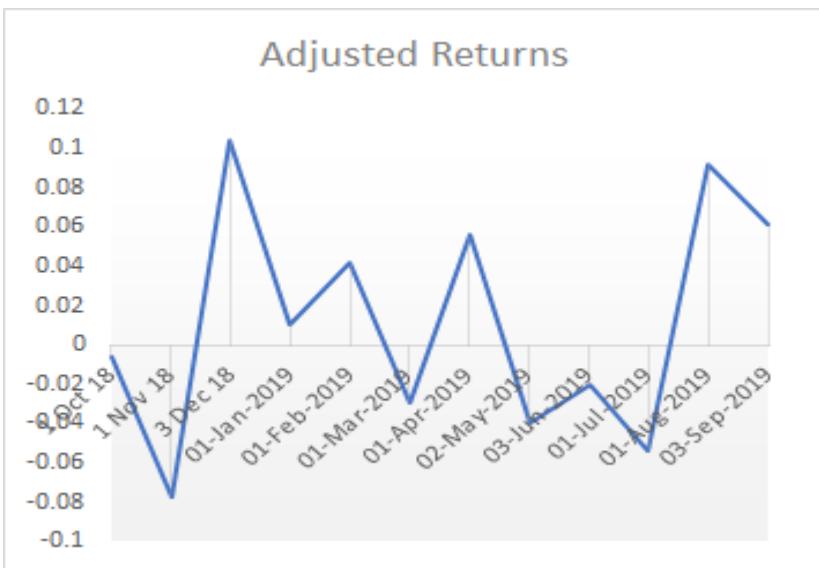
Daily



## Weekly



## Monthly

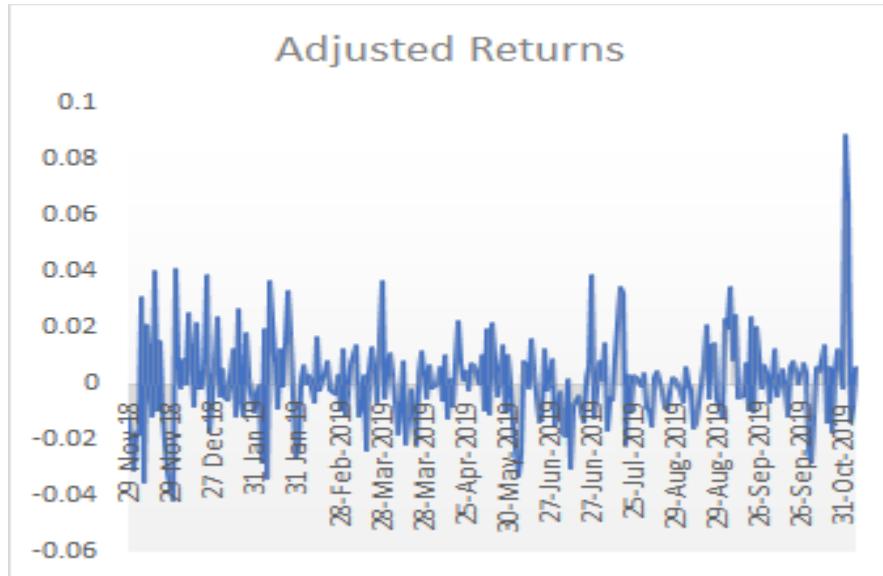


## Middle

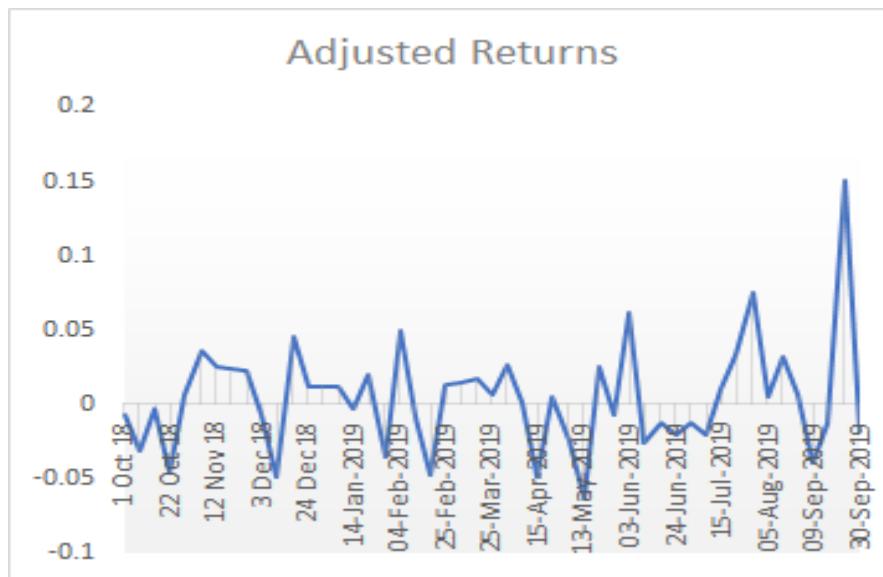
Returns	Daily	Weekly	Monthly
<b>Mean</b>	0.1224%	0.4449%	1.0055%
<b>Max</b>	8.8951%	15.1265%	9.1863%

<b>Min</b>	-4.1576%	-6.3906%	-7.0753%
<b>Standard Deviation</b>	1.6081%	3.6646%	5.6888%

Daily

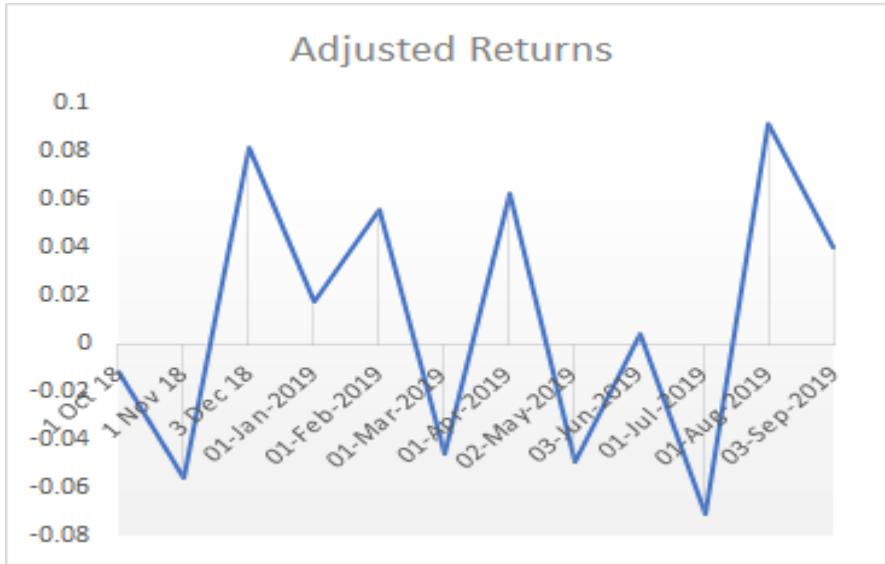


weekly



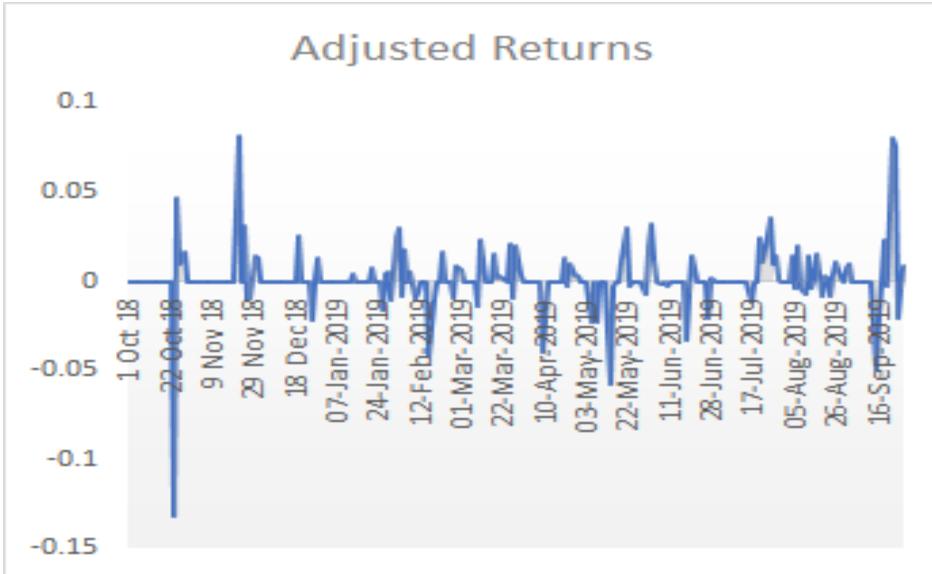
Monthly

*Far*

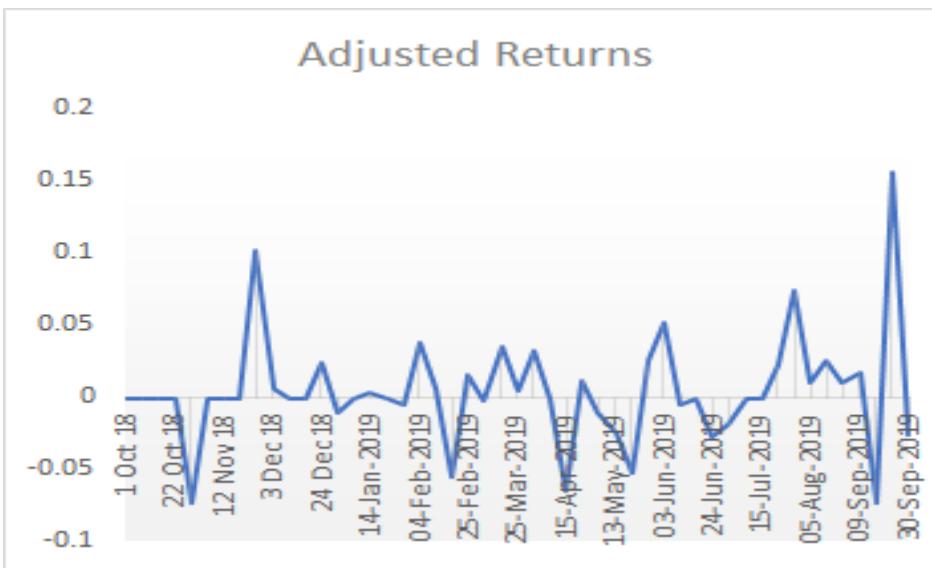


Returns	Daily	Weekly	Monthly
<b>Mean</b>	0.1238%	0.4105%	1.1630%
<b>Max</b>	8.0907%	15.5873%	10.4446%
<b>Min</b>	-13.2116%	-7.3446%	-7.7164%
<b>Standard Deviation</b>	1.6680%	3.8854%	5.8968%

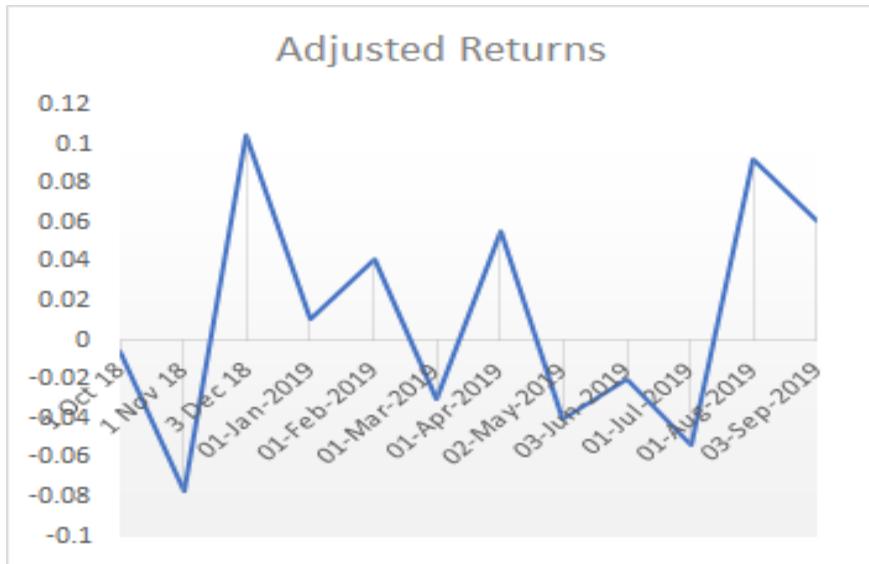
Daily



Weekly



Monthly



## Economic Interpretation

### Observations:

- The risk unadjusted returns are greater than the risk adjusted returns.
- The volatility and standard deviation is almost equal in risk unadjusted returns and in risk adjusted returns.
- The percentage of mean returns increase from daily, weekly to monthly in risk unadjusted returns in both risk unadjusted and risk adjusted returns.
- The volatility is increasing from daily, weekly to monthly in risk adjusted and risk unadjusted returns.

### Action:

- Therefore, both risk-averse and risk-loving investors are advised to follow daily investment schedule to get greater returns with lesser risk.
- An investor who wishes to hedge is also advised to follow daily investment schedule, earning higher returns at lower risk.

- More contracts are traded for in the Near months as compared to Next and Far months so they are a better choice to trade in
- All adjusted returns are positive so invest in the stock futures instead of T-bills.

# Aurobindo Pharma

## Introduction:

From that day of introducing the futures, the trading volume of the company's underlying and contracts was growing at a very high rate.

Futures trading is more than trading in the corresponding underlying.

<b>Items</b>	<b>Value</b>
<b>Date of Issue</b>	07/11/2003
<b>Lot Size</b>	1000
<b>Contract Specifications</b>	

## Returns

### *Risk Unadjusted*

#### *Near*

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.0923	-0.3660	-1.7842
<b>Max</b>	7.6426	9.6572	9.7712
<b>Min</b>	-7.6478	-8.6543	-17.6401
<b>Standard Deviation</b>	1.9697	3.7652	9.2795

### *Middle*

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.0928	-0.3676	-1.7755
<b>Max</b>	7.6037	9.4671	-2.2191
<b>Min</b>	-7.6134	-8.4402	-2.5469
<b>Standard Deviation</b>	1.9597	3.7287	-1.9329

### *Far*

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.0926	-0.3324	-1.7853
<b>Max</b>	7.7333	10.1189	9.9203
<b>Min</b>	-7.7137	-9.6662	-17.8081
<b>Standard Deviation</b>	2.0120	3.9472	9.3404

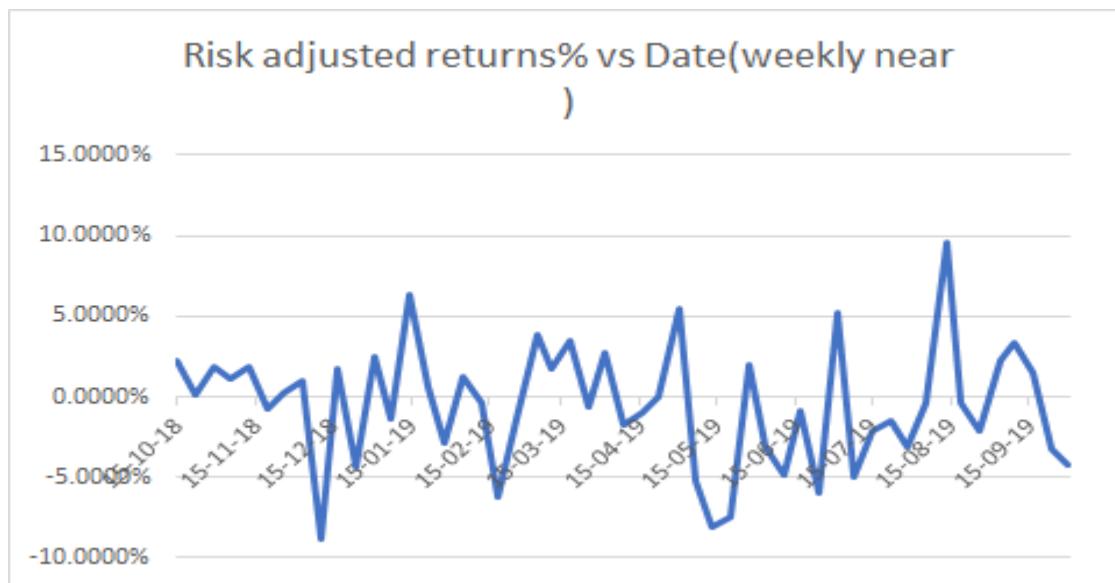
### *Risk Adjusted*

### *Near*

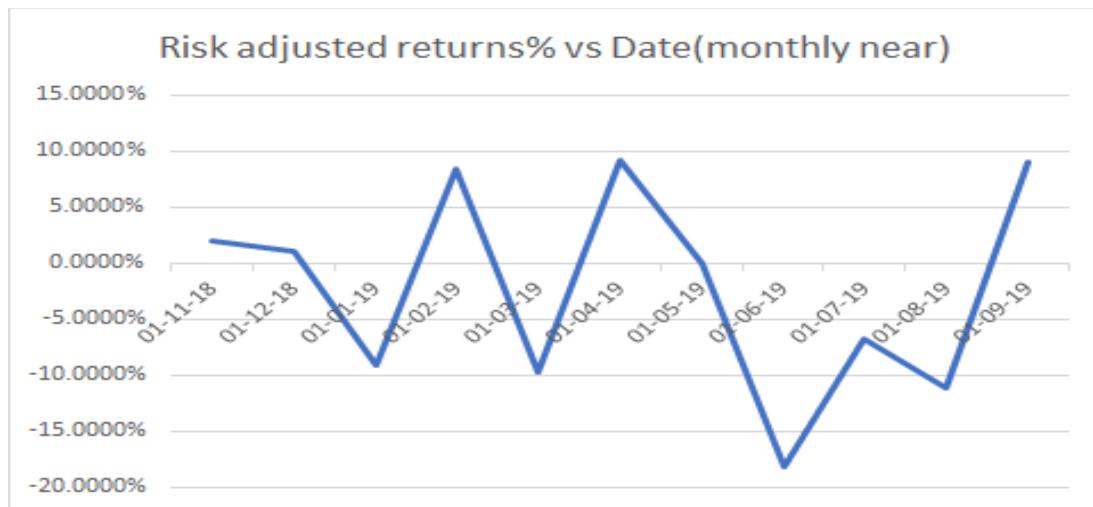
<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	-0.1094	-0.4853	-2.2961

<b>Max</b>	7.6277	9.5519	9.2378
<b>Min</b>	-7.6652	-8.7828	-18.1409
<b>Standard Deviation</b>	1.9697	3.7650	9.2716

**Daily**



**Weekly**

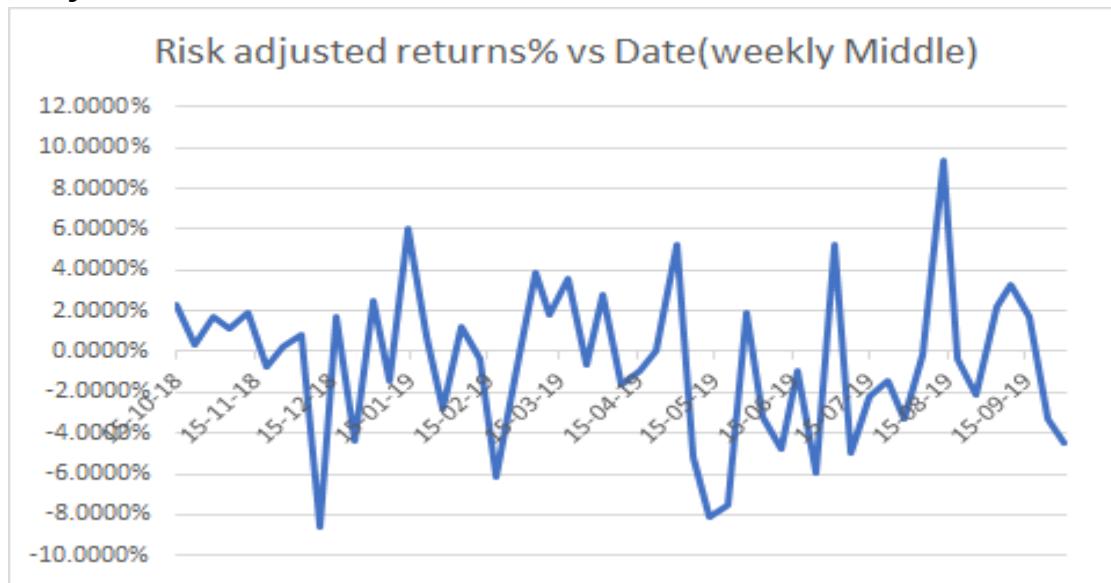


**Monthly**

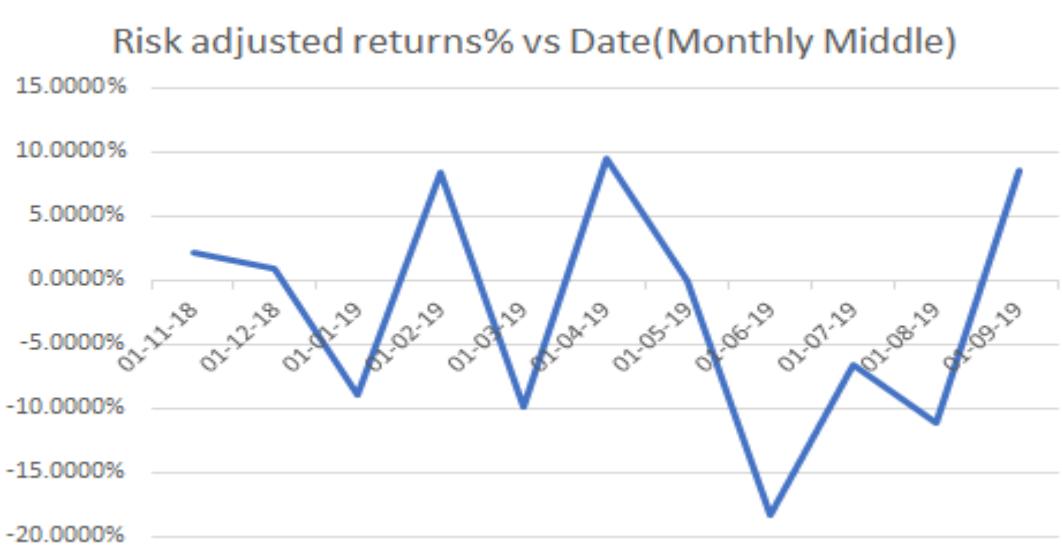
**Middle**

Returns	Daily	Weekly	Monthly
Mean	-0.1100	-0.4869	-2.2873
Max	7.5892	9.3618	9.4721
Min	-7.6313	-8.5687	-18.3118
Standard Deviation	1.960	3.7284	9.2828

## Daily



## Weekly

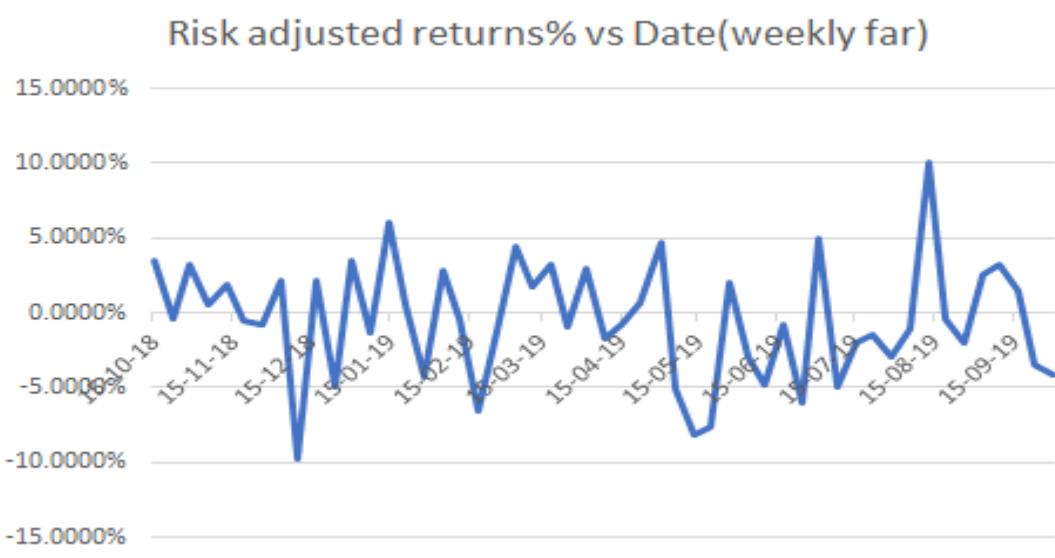


**Monthly**

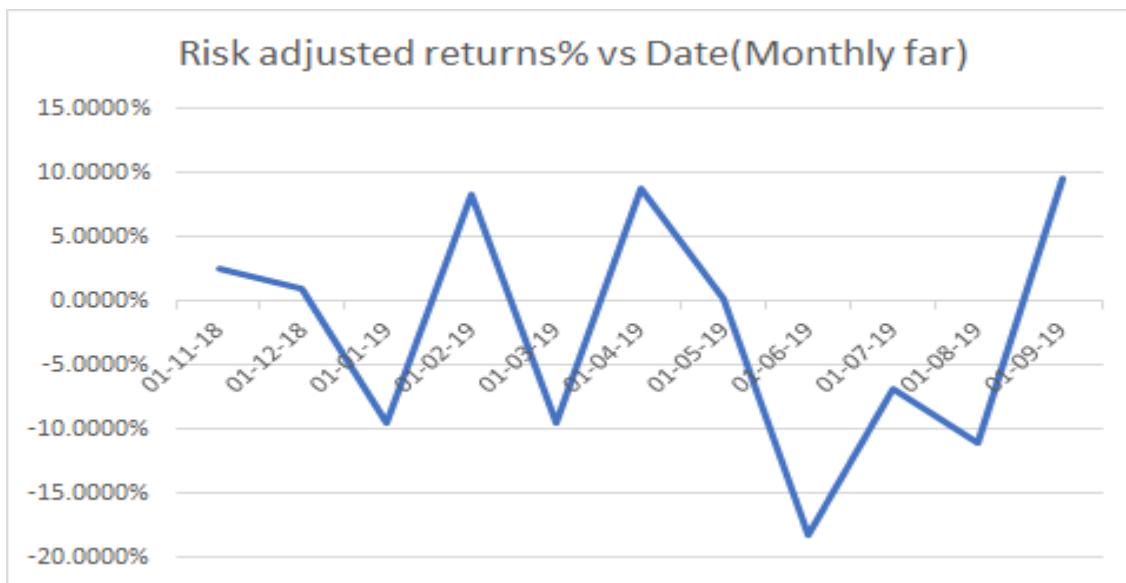
**Far**

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.1098	-0.4518	-2.2972
<b>Max</b>	7.7184	10.0136	9.4753
<b>Min</b>	-7.7311	-9.7947	-18.3090
<b>Standard Deviation</b>	2.0120	3.9469	9.3329

**Daily**



**Weekly**



**Monthly**

## Economic Interpretation

### Observations

- The risk adjusted returns are not higher than risk unadjusted returns, since to adjust for risk, risk-free rate is deducted from the returns
- As expected, there is no difference in the volatility and standard deviation of unadjusted returns and risk adjusted returns.

- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns.
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns
- Trend observed in Returns: Near > Far > Middle

### Action

- Risk Averse and Risk Tolerant should invest in near month derivatives to achieve higher return with comparatively lesser risk than far month derivatives
- A hedging investor should follow near month schedule, thereby earning more returns at comparatively less risk.
- However, considering that even the ultra-short term returns are negative it would be better to invest in risk free instruments

# Axis Bank

## Introduction

<i>Items</i>	<i>Value</i>
<i>Date of Issue</i>	05/07/2002
<i>Lot Size</i>	875

## Returns

### *Risk Unadjusted*

#### *Near*

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	0.0694	0.403	0.958
<i>Max</i>	6.436	9.864	12.687
<i>Min</i>	-4.564	-7.791	-18.02
<i>Standard Deviation</i>	1.771	3.852	7.149

#### *Middle*

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	0.0732	0.271	1.043
<i>Max</i>	6.441	9.739	12.553

<i>Min</i>	-4.561	-7.951	-18.286
<i>Standard Deviation</i>	1.746	3.719	7.1219

*Far*

<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	0.0908	0.359	1.403
<i>Max</i>	5.885	9.617	11.617
<i>Min</i>	-7.055	-7.872	-18.671
<i>Standard Deviation</i>	1.660	3.537	7.1093

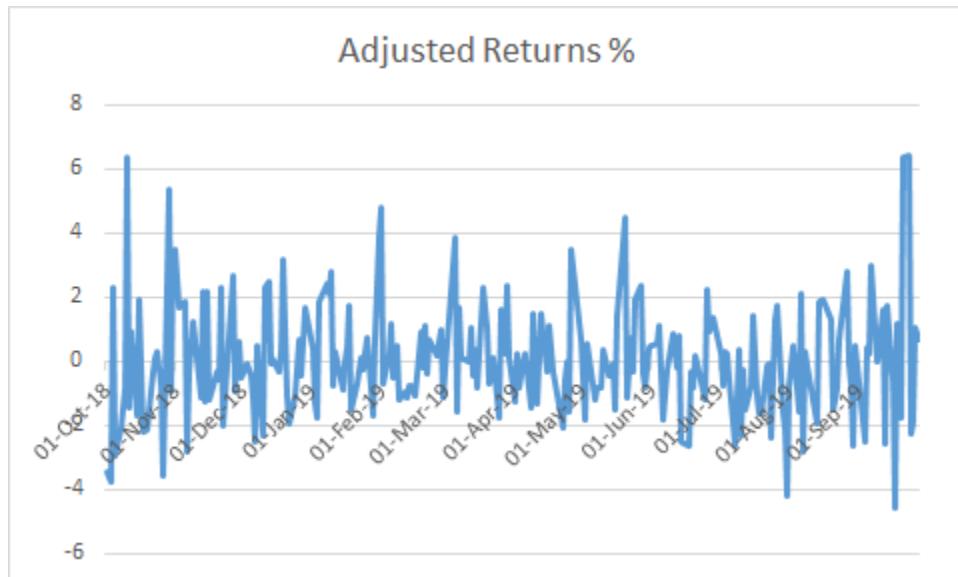
*Risk Adjusted*

*Near*

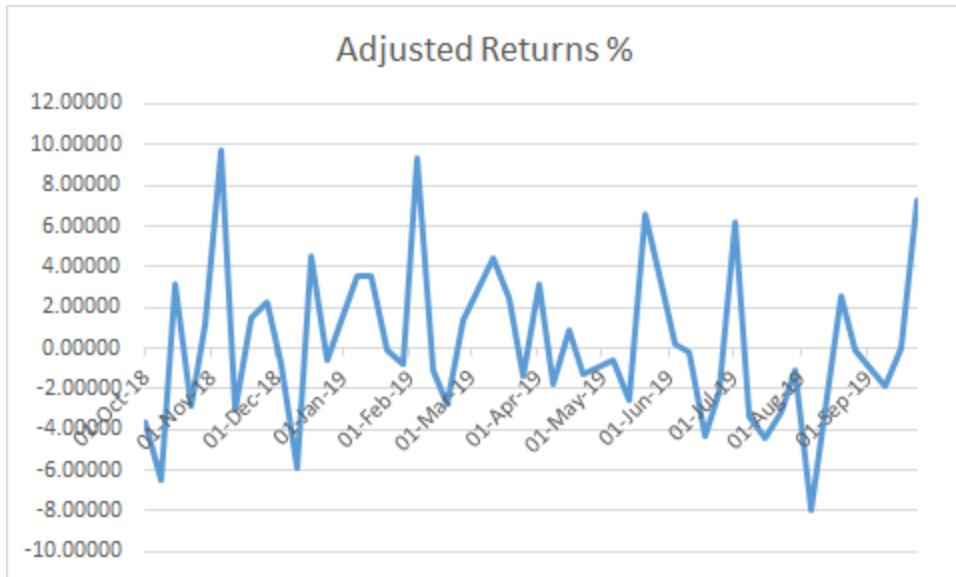
<i>Returns</i>	<i>Daily</i>	<i>Weekly</i>	<i>Monthly</i>
<i>Mean</i>	0.0522	0.2819	0.441
<i>Max</i>	6.422	9.733	12.152

<b>Min</b>	-4.578	-7.907	-18.47
<b>Standard Deviation</b>	1.771	3.852	7.133

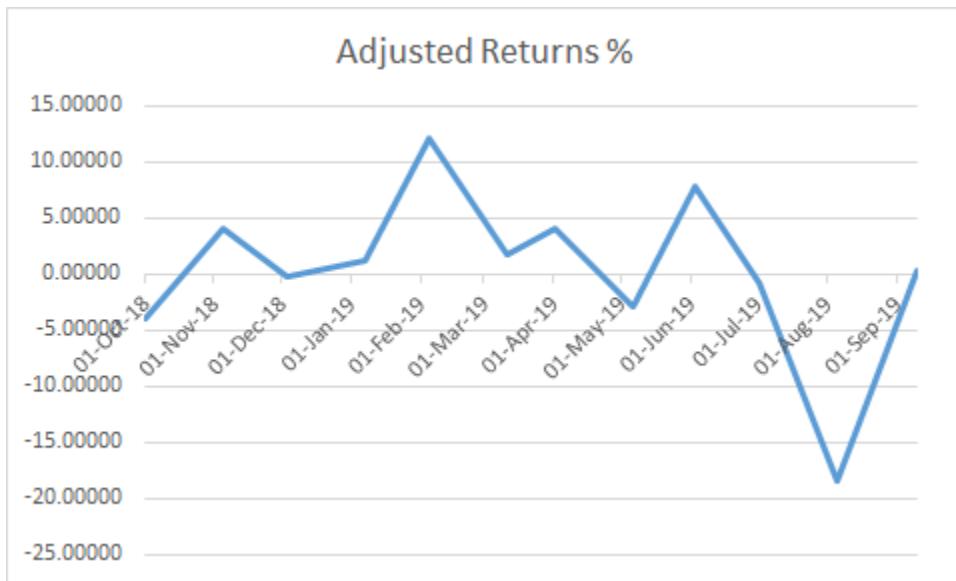
Daily:



Weekly:



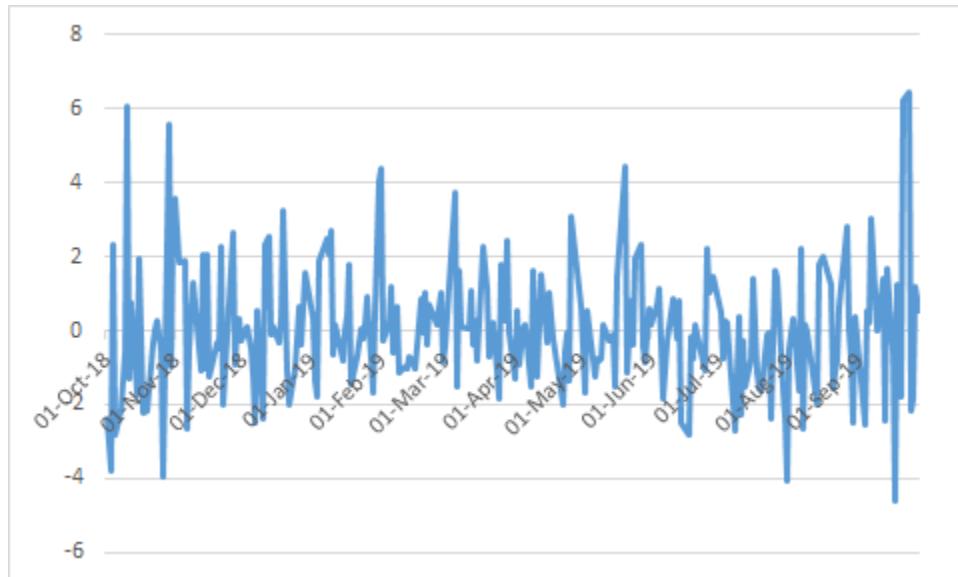
Monthly:



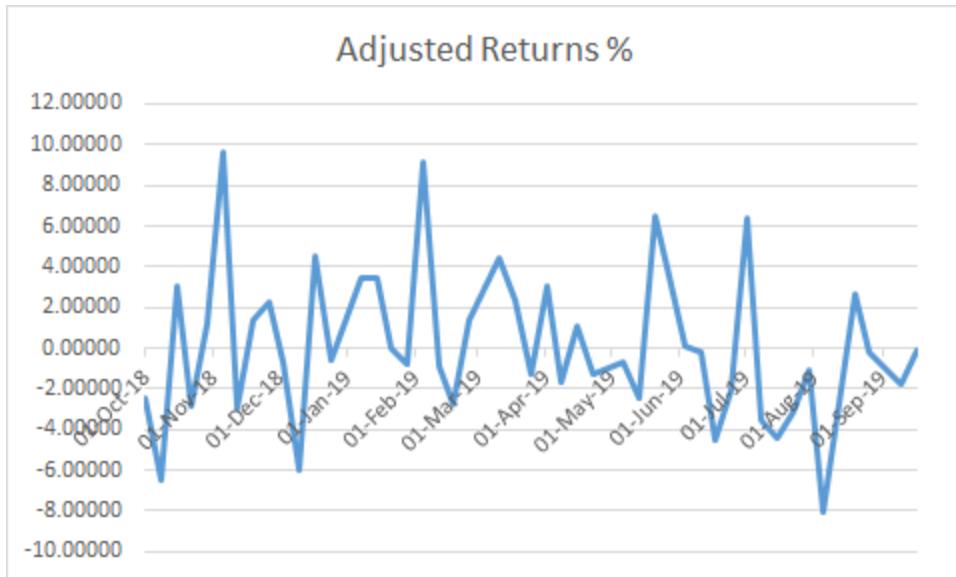
**Middle**

Returns	Daily	Weekly	Monthly
Mean	0.0560	0.149	0.528
Max	6.426	9.608	12.01
Min	-4.57	-8.062	-18.73
Standard Deviation	1.746	3.718	7.105

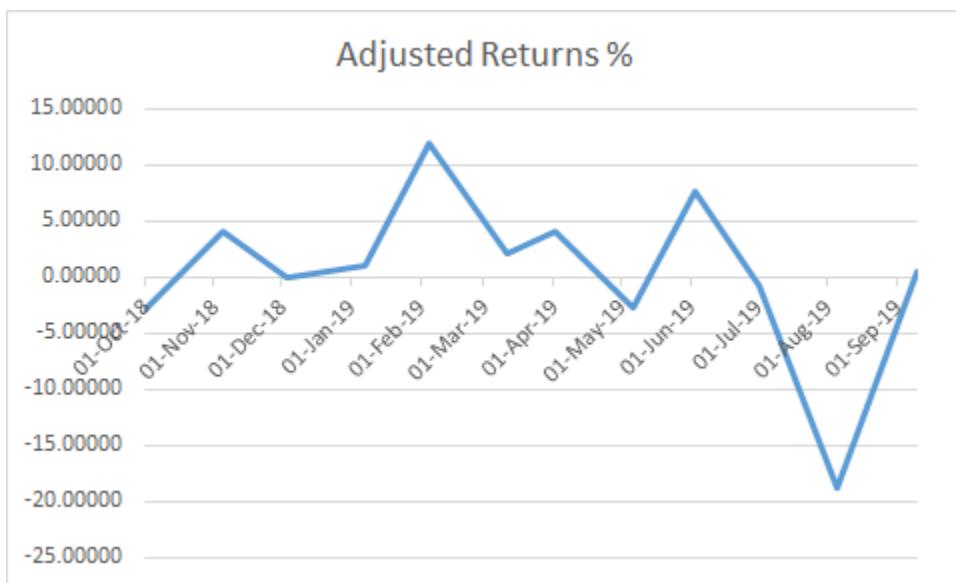
Daily:



Weekly:



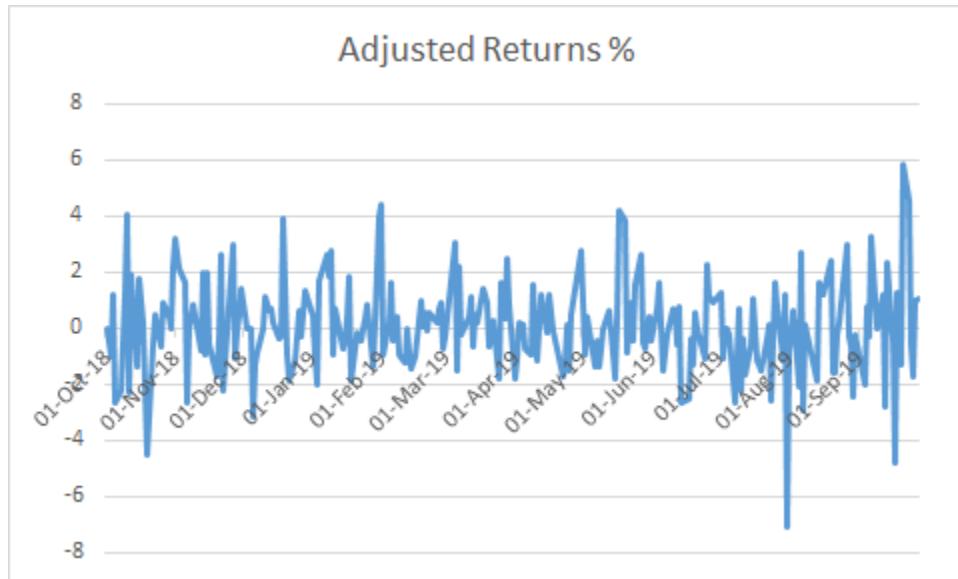
Monthly:



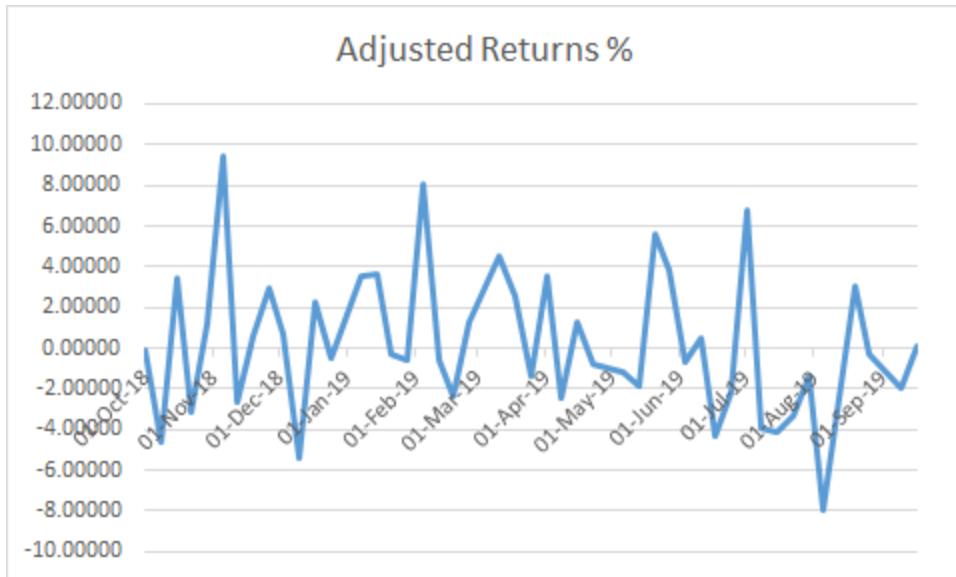
**Far**

Returns	Daily	Weekly	Monthly
Mean	0.073	0.230	0.885
Max	5.870	9.486	11.08
Min	-7.07	-7.982	-19.123
Standard Deviation	1.660	3.498	7.093

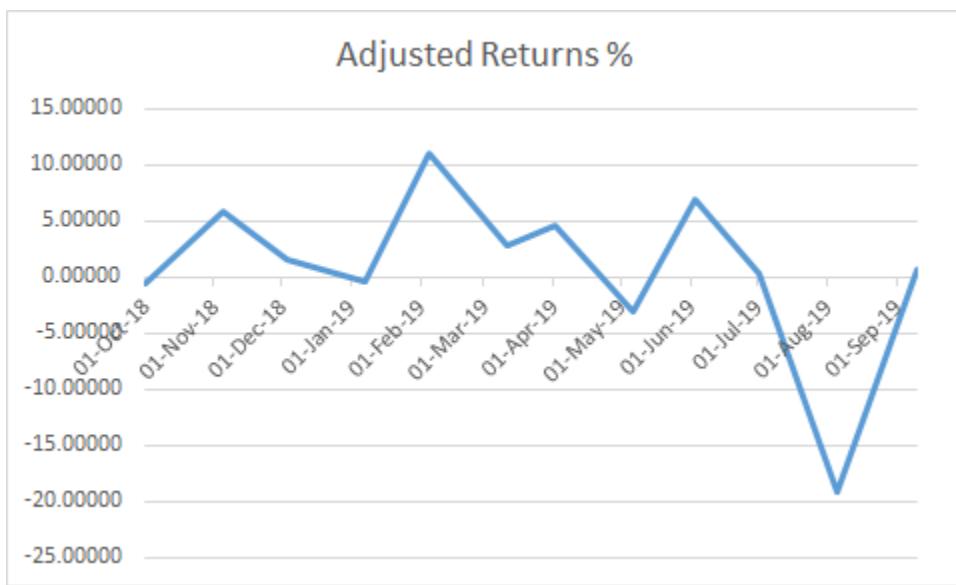
Daily:



Weekly:



Monthly:



## Economic Interpretation

# State Bank of India

## Introduction

Items	Value
Date of Issue	05/07/2002
Lot Size	3000

## Returns

### *Risk Unadjusted*

#### *Near*

Returns	Daily	Weekly	Monthly
Mean	0.0302%	0.0355%	-0.4055%
Max	9.9143%	6.9490%	15.4722%
Min	-7.2442%	-7.8574%	-18.8641%
Standard Deviation	2.0790%	3.7913%	10.0421%

#### *Middle*

Returns	Daily	Weekly	Monthly
Mean	0.0305%	0.0394%	-0.9217%
Max	9.8911%	6.8429%	14.8277%

<b>Min</b>	-7.1781%	-7.6639%	-19.2947%
<b>Standard Deviation</b>	2.0777%	3.7914%	10.0336%

### *Far*

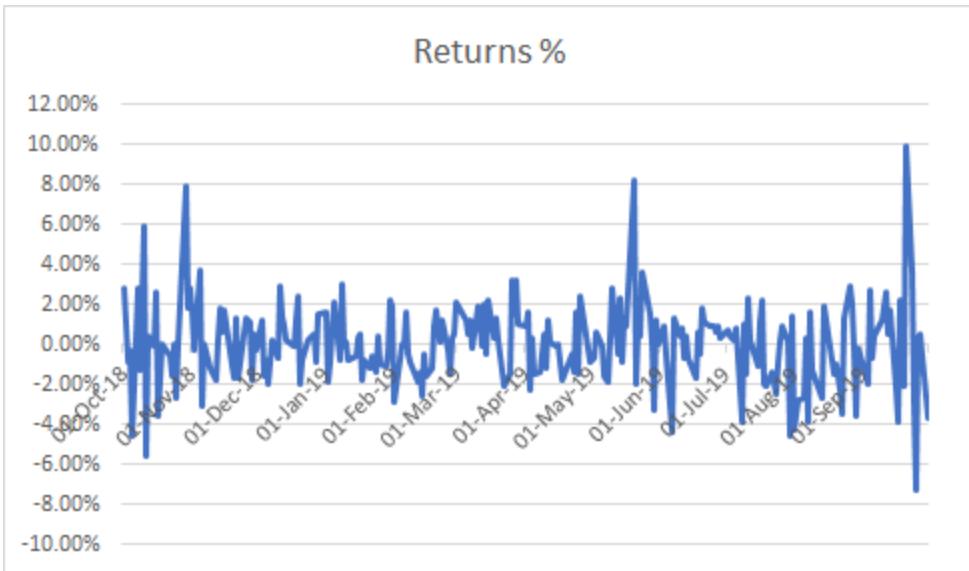
<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	0.0086%	-0.0994%	-0.4723%
<b>Max</b>	9.7199%	6.9831%	15.3929%
<b>Min</b>	-7.3515%	-7.9298%	-18.8481%
<b>Standard Deviation</b>	2.0323%	3.7068%	9.9828%

### *Risk Adjusted*

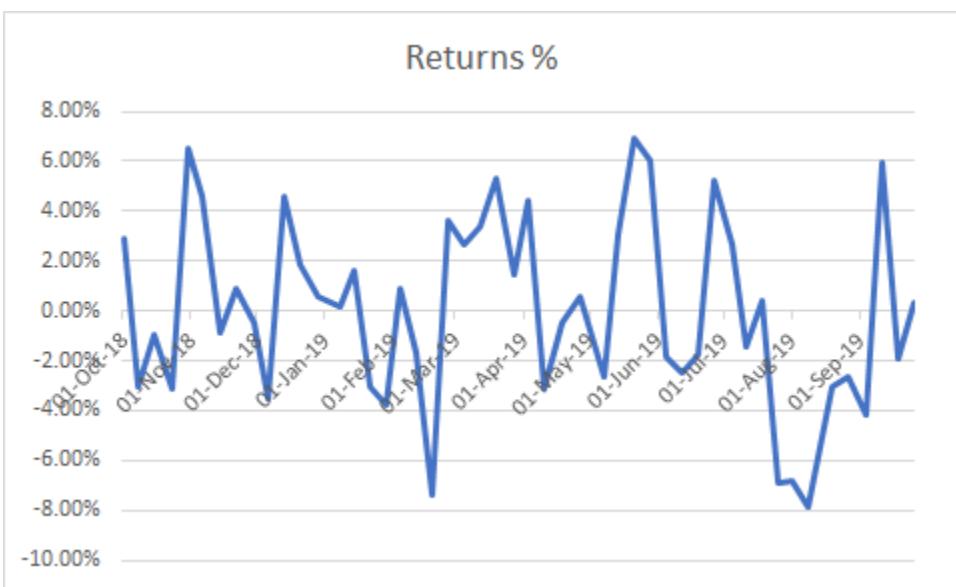
### *Near*

<b>Returns</b>	<b>Daily</b>	<b>Weekly</b>	<b>Monthly</b>
<b>Mean</b>	0.0131%	-0.0851%	-0.9229%
<b>Max</b>	9.8998%	6.8268%	14.9388%
<b>Min</b>	-7.2591%	-7.9660%	-19.3091%
<b>Standard Deviation</b>	2.0789%	3.7892%	10.0174%

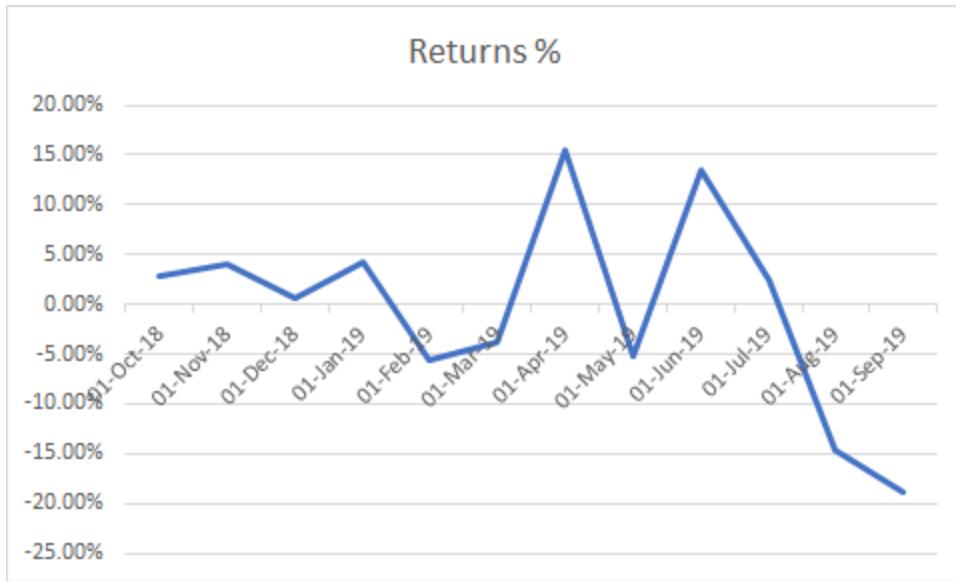
*Daily*



*Weekly*

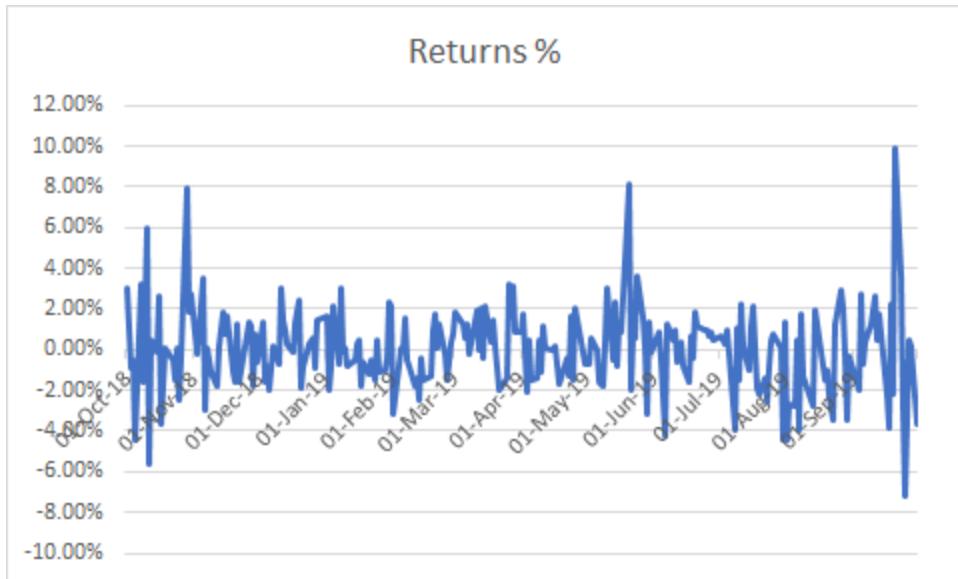


*Monthly*

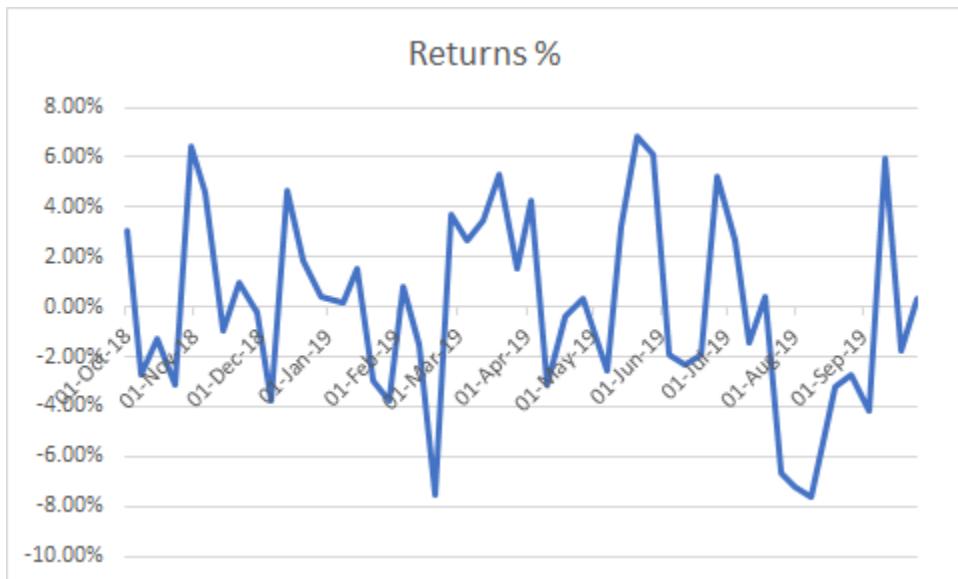


### Middle

Returns	Daily	Weekly	Monthly
<b>Mean</b>	0.0133%	-0.0813%	-0.9217%
<b>Max</b>	9.8765%	6.7208%	14.8277%
<b>Min</b>	-7.1929%	-7.7725%	-19.2947%
<b>Standard Deviation</b>	2.0776%	3.7893%	10.0336%



*Daily*



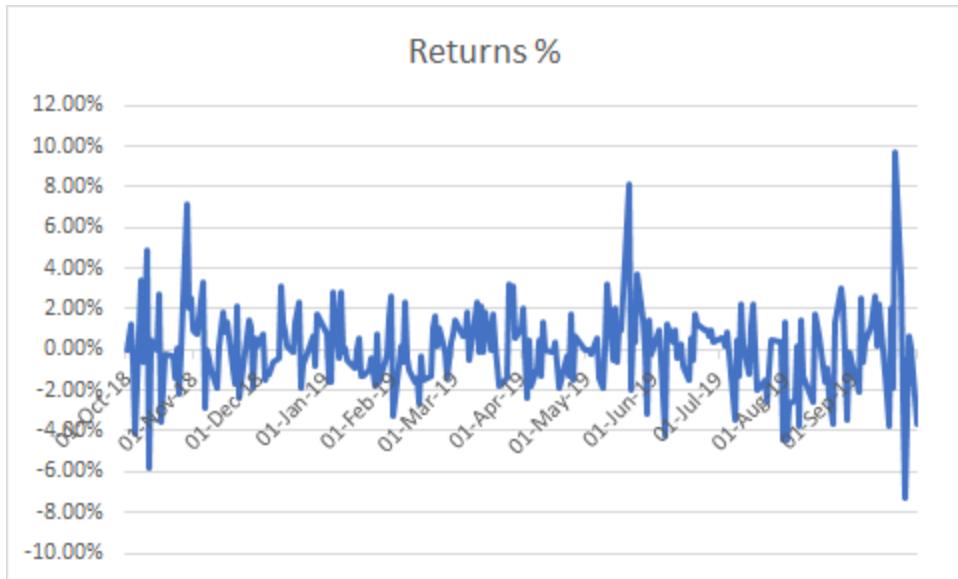
*Weekly*



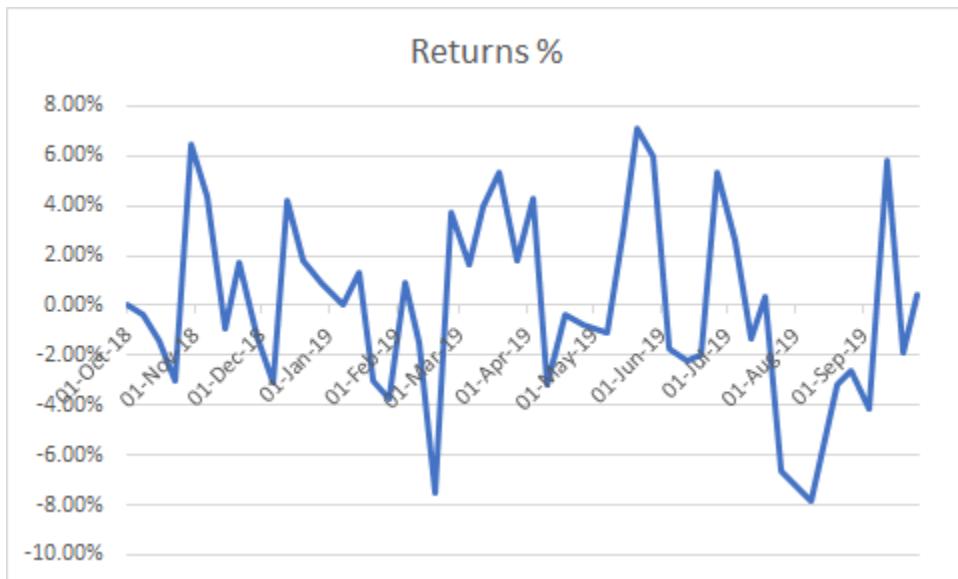
*Monthly*

*Far*

Returns	Daily	Weekly	Monthly
<b>Mean</b>	0.0086%	-0.0994%	-0.9897%
<b>Max</b>	9.7199%	6.9831%	14.8595%
<b>Min</b>	-7.3515%	-7.9298%	-19.2931%
<b>Standard Deviation</b>	2.0323%	3.7068%	9.9590%



*Daily*



*Weekly*



*Monthly*

## Economic Interpretation

### Observations:

- The risk adjusted returns are not higher than risk unadjusted returns, since to adjust for risk, risk-free rate is deducted from the returns
- As expected, there is no difference in the volatility and standard deviation of unadjusted returns and risk adjusted returns.
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns.
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns
- Trend observed in Returns: Middle>Near>Far

### Action

- Risk Averse and Risk Tolerant should invest in middle month derivatives to achieve higher return with comparatively lesser risk than far month derivatives
- A hedging investor should follow middle month schedule, thereby earning more returns at comparatively less risk.

- However, considering that even the ultra-short-term returns are negative it would be better to invest in risk free instruments

# Steel Authority of India

## Introduction

From that day of introducing the futures, the trading volume of the company's underlying and contracts was growing at a very high rate.

Futures trading is more than trading in the corresponding underlying

Items	Value
Date of Issue	09/09/2000
12000	12000
Contract Specifications	

## Returns

### *Risk Unadjusted*

#### *Near*

Returns	Daily	Weekly	Monthly
Mean	-0.2605	-1.1268	-6.4526
Max	9.1192	13.1148	13.5922
Min	-8.3333	-11.6197	-26.9139
Standard Deviation	2.8828	5.6592	12.0791

#### *Middle*

Returns	Daily	Weekly	Monthly
Mean	-0.2621	-1.1302	-6.4779
Max	8.7359	12.9328	13.8859
Min	-8.2849	-11.5587	-26.6428
Standard Deviation	2.8791	5.6282	11.9998

*Far*

Returns	Daily	Weekly	Monthly
Mean	-0.2596	-1.1192	-6.5129
Max	8.8776	14.0387	13.2696
Min	-8.2653	-11.8615	-28.2710
Standard Deviation	2.9378	5.7766	12.1266

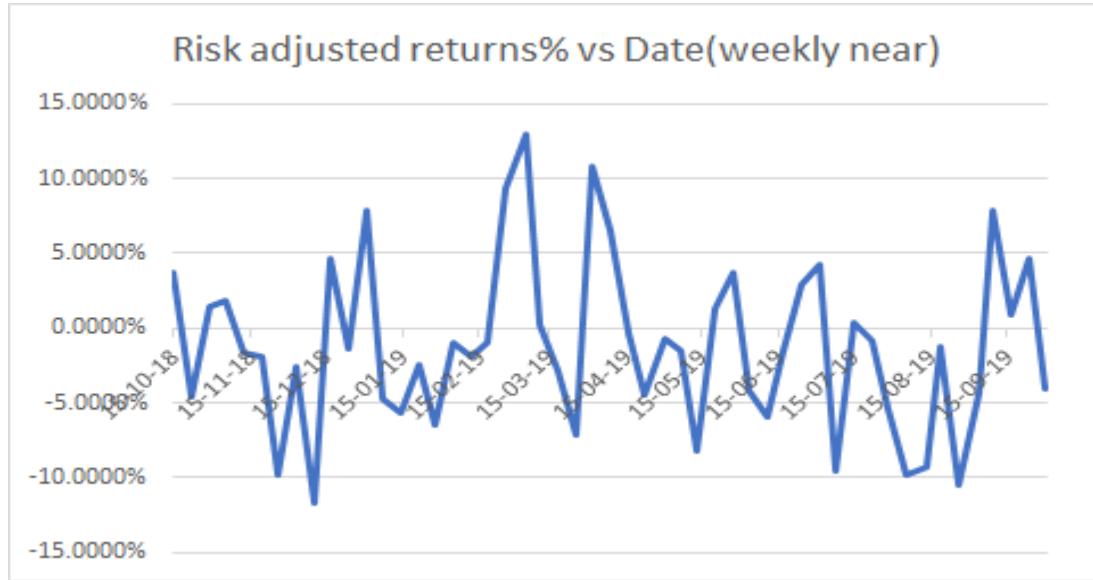
*Risk Adjusted*

*Near*

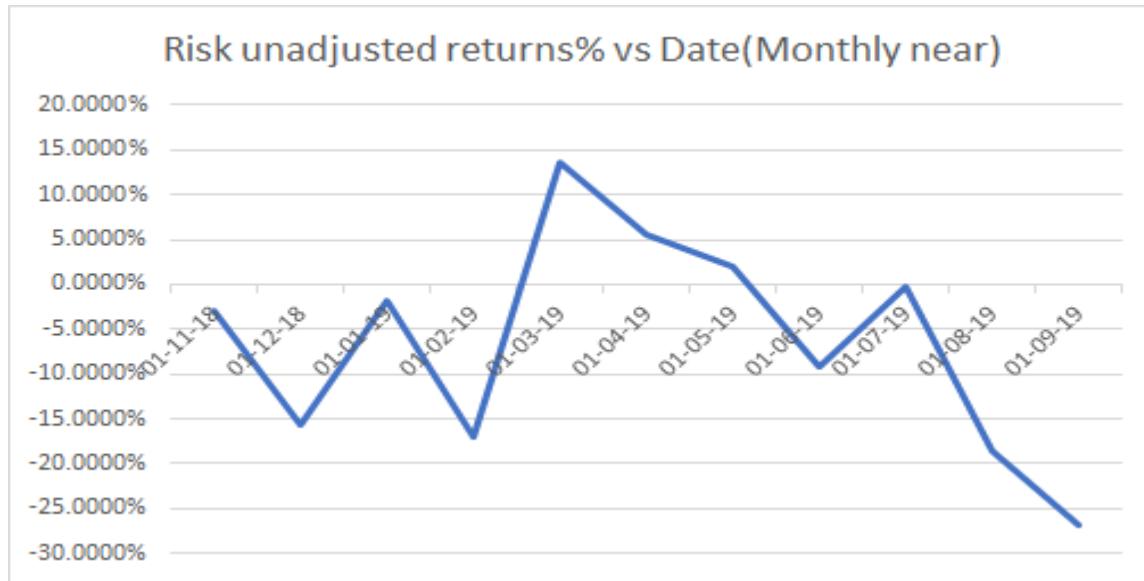
Returns	Daily	Weekly	Monthly

<b>Mean</b>	-0.2777	-1.2461	-6.9644
<b>Max</b>	9.1016	12.9915	13.0822
<b>Min</b>	-8.3483	-11.7482	-27.3589
<b>Standard Deviation</b>	2.8827	5.6582	12.0640

## Daily



## Weekly

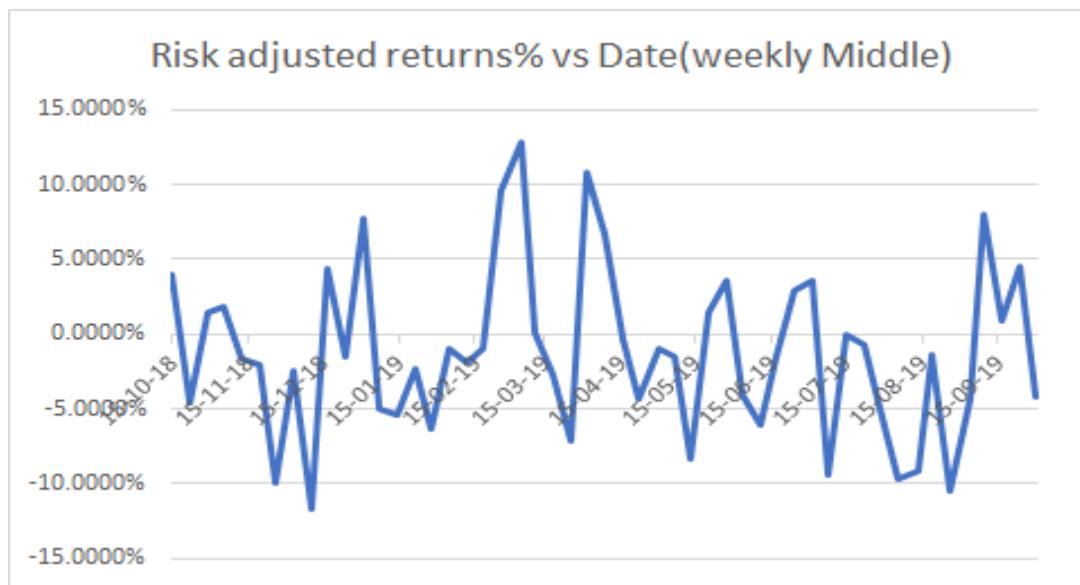


**Monthly**

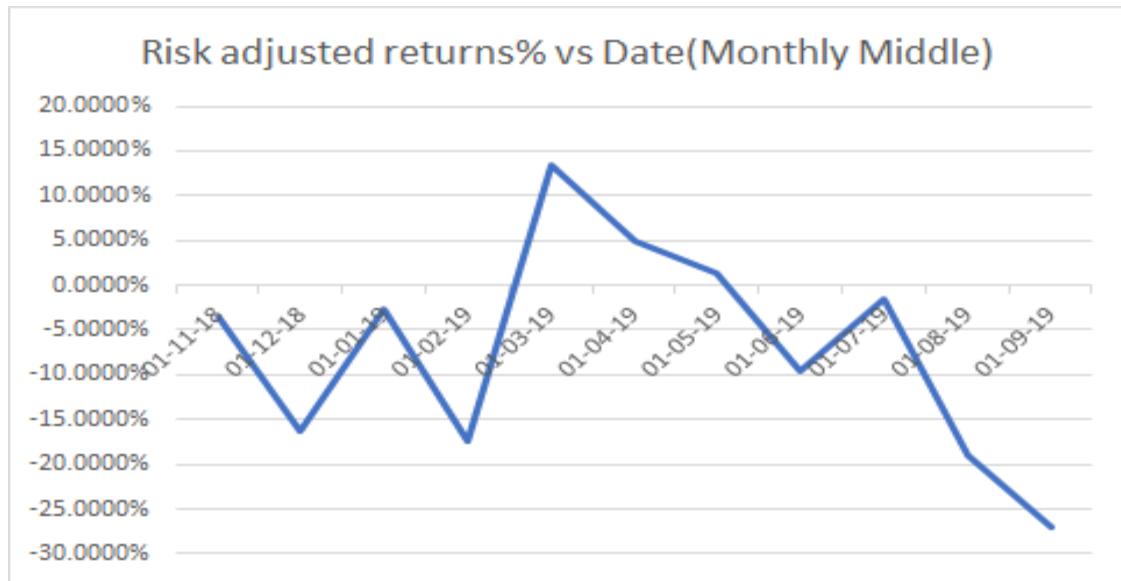
**Middle**

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.2792	-1.2496	-6.9897
<b>Max</b>	8.7183	12.8095	13.3759
<b>Min</b>	-8.2998	-11.6871	-27.0878
<b>Standard Deviation</b>	2.8791	5.6272	11.9848

**Daily**



**Weekly**

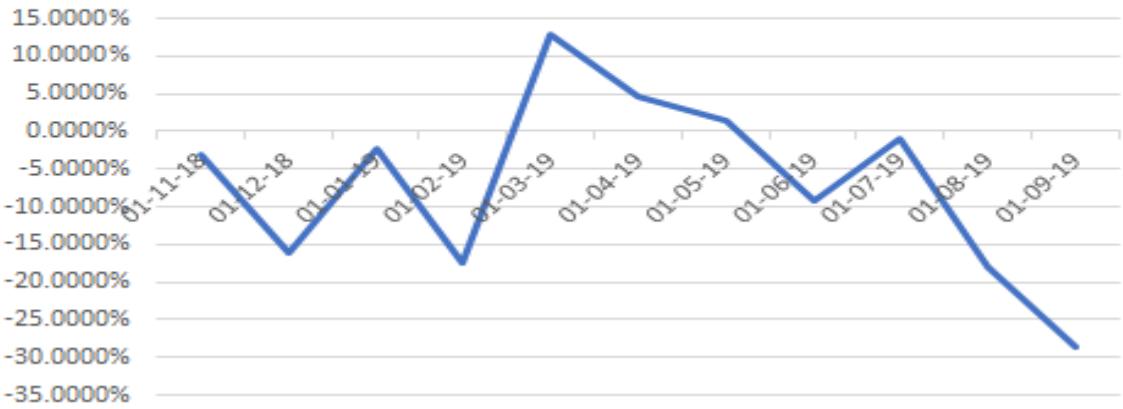


**Monthly**

**Far**

Returns	Daily	Weekly	Monthly
<b>Mean</b>	-0.2768	-1.2385	-7.0247
<b>Max</b>	8.8600	13.9154	12.7596
<b>Min</b>	-8.2828	-11.9899	-28.7160
<b>Standard Deviation</b>	2.9378	5.7756	12.1113

## Risk adjusted returns% vs Date(monthly far)



**Monthly**

## Economic Interpretation

### Observations

- The risk adjusted returns are not higher than risk unadjusted returns, since to adjust for risk, risk-free rate is deducted from the returns
- As expected, there is no difference in the volatility and standard deviation of unadjusted returns and risk adjusted returns.
- Mean Returns show a decreasing trend in Daily, Weekly and Monthly Frequency
- The volatility is increasing from daily, weekly to monthly in risk unadjusted returns.
- Volatility increases at a similar rate for both Risk Adjusted and Risk Unadjusted Returns
- Trend observed in Returns: Far >Near >Middle

### Action

- Risk Averse and Risk Tolerant should invest in far month derivatives to achieve higher return with comparatively lesser risk than far month derivatives
- A hedging investor should follow far month schedule, thereby earning more returns at comparatively less risk.
- However, considering that even the ultra-short term returns are negative it would be better to invest in risk free instruments



## Comparison on Adjusted Returns

### Apollo

- The mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset.
- Hence, it is profitable to invest in NEAR Month Contracts as compared to Next or Far month, to earn similar returns within a lesser time period.
- The returns decreased slightly but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a daily investment schedule, earning better returns at low risk.
- Even for a risk-loving investor it is advisable to take up a daily investment schedule, earning high returns at lower risk.
- As adjusted returns are negative, it's advisable to invest in Government Bonds.

Comparison is done and shown below

Type	Daily	Weekly	Monthly
Equity	-0.1018%	-0.4905%	-2.2530%
Near	-0.04270%	-0.37570%	-2.40780%
Middle	-0.04850%	-0.42090%	-2.45630%
Far	-0.0846%	-0.4995%	-2.9712%

Liquidity Position

Considering Daily values:

	Near	Middle	Far
--	------	--------	-----

Average number of contracts	2643	482	5
Average Open Interest	87,15,432	16,24,814	76358

For Underlying average volume = 2863578

Average number of trades = 29647

- It is seen that the liquidity position is the best for the Near contracts, followed by the Middle contracts and is the worst for the Far contracts.
- Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher.
- Far contracts have very few contracts available and have very poor liquidity position.
- Hence it may be a viable option to trade in the Near contracts.
-

# Arvind

- The mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset.
- Hence, it is profitable to invest in NEAR Month Contracts as compared to Next or Far month, to earn similar returns within a lesser time period.
- The returns decreased slightly but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a daily investment schedule, earning better returns at low risk.
- Even for a risk-loving investor it is advisable to take up a daily investment schedule, earning high returns at lower risk.
- As adjusted returns are negative, it's advisable to invest in Government Bonds.

Comparison is done and shown below

Type	Daily	Weekly	Monthly
Equity	-0.3481%	-1.6291%	-8.3851%
Near	-0.5907%	-2.6042	-12.9769%
Middle	-0.6474%	-3.1025%	-12.5736%
Far	-0.6382%	-3.0317%	-12.2667%

## Liquidity Position

Considering Daily values:

	Near	Middle	Far
--	------	--------	-----

Average number of contracts	2575	410	6
Average Open Interest	56,53,835	10,42,684	61,930

For Underlying

average volume = 42,57,372

Average number of trades = 23778

- It is seen that the liquidity position is the best for the Near contracts, followed by the Middle contracts and is the worst for the Far contracts.
- Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher.
- Far contracts have very few contracts available and have very poor liquidity position.
- Hence it may be a viable option to trade in the Near contracts.

# Ashok Leyland

The mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset. Hence, it is profitable to invest in Far Month Contracts as compared to Next or Near month, to earn better returns within a lesser time period.

The returns are uncertain but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a monthly investment schedule, earning better returns at low risk. Even for a risk-loving investor it is advisable to take up a monthly investment schedule, earning high returns at lower risk.

As adjusted returns are positive, it's advisable to invest in Far Options.

Comparison is done and shown below

Type	Daily	Weekly	Monthly
Equity	2.7815%	3.677%	9.006%
Near	-0.20%	-1.06%	-5.13%
Middle	-0.202%	-1.09%	-0.579%
Far	-0.199%	-1.07%	-5.24%

Liquidity Position:

Considering Daily values:

	Near	Middle	Far
Average number of contracts	7785	2818	87
Average Open Interest	60433811	11721295	560704

For Underlying average volume = 10178467

Average number of trades = 45130

It is seen that the liquidity position is the best for the Near contracts, followed by the Middle contracts and is the worst for the Far contracts.

Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher. Far contracts have very few contracts available and have very poor liquidity position.

Hence it may be a viable option to trade in the Near contracts.

## Asian Paints

- Volatility increases from Near, middle to Far month.
- However, the mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset.
- Hence, it is profitable to invest in NEAR Month Contracts as compared to Next or Far month, to earn similar returns within a lesser time period.
- The returns decreased slightly but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a daily investment schedule, earning better returns at low risk.
- Even for a risk-loving investor it is advisable to take up a daily investment schedule, earning high returns at lower risk.
- As adjusted returns are positive, it's advisable to invest in equity.
- Comparison is done and shown below :

Type	Daily	Weekly	Monthly
Equity	0.1413	0.2406	0.8227
Near	0.0013	0.0044	0.0190
Middle	0.0012	0.0044	0.0100
Far	0.0012	0.0041	0.0116

Liquidity Position:

Considering Daily values:

	Near	Middle	Far
Average number of contracts	4138	7873	3
Average Open Interest	5189600	279984	4060

Average number of trades:60848

Average traded quantity:1374344

- It is seen that the liquidity position is the best for the Middle contracts, followed by the Near contracts and is the worst for the Far contracts
- Based on the comparison average traded quantity of equity with the data from the futures, the liquidity position lies between middle and far contracts.
- The average number of trades of stocks are much higher than that of any futures contracts.

- Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher.
- Far contracts have very few contracts available and have very poor liquidity position.
- Hence it may be a viable option to trade in the Middle contracts.

## Auropharma

- Volatility increases from Near, middle to Far month.
- However, the mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset.
- Hence, it is profitable to invest in the underlying or near Month Contracts as compared to Next or Far month, to earn decent returns within a lesser time period.
- The returns decreased slightly but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a daily investment schedule, earning better returns at low risk.
- Even for a risk-loving investor it is advisable to take up a daily investment schedule, earning high returns at lower risk.
- As adjusted returns are negative, it's advisable to invest in t-bills.
- Comparison is done and shown below :

Type	Daily	Weekly	Monthly
Equity	-0.1078	-0.4718	-2.7590
Near	-0.1094	-0.4853	-2.2961
Middle	-0.1100	-0.4869	-2.2873
Far	-0.1098	-0.4518	-2.2972

### **Liquidity Position:**

Considering Daily values as they show the true picture how how fast the asset can be liquidated,

	Near	Middle	Far
Average No. of Contracts	6721	710	7
Average Open Interest	15376943	2422873	12492

### **For Underlying:**

Average Number of Trades = 59366

Average Traded Quantity = 2622826

- It is seen that the liquidity position is the best for the Middle contracts, followed by the Near contracts and is the worst for the Far contracts
- Based on the comparison average traded quantity of equity with the data from the futures, the liquidity position lies between middle and near contracts.
- The average number of trades of stocks are much higher than that of any futures contracts.
- Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher.
- Far contracts have very few contracts available and have very poor liquidity position.
- Hence it may be a viable option to trade in the Middle contracts

## Axis Bank

The mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset.

Hence, it is profitable to invest in Far Month Contracts as compared to Next or Near month, to earn better returns within a lesser time period.

The returns are uncertain but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a monthly investment schedule, earning better returns at low risk. Even for a risk-loving investor it is advisable to take up a monthly investment schedule, earning high returns at lower risk.

As adjusted returns are positive, it's advisable to invest in Far Options.

Comparison is done and shown below

Type	Daily	Weekly	Monthly
Equity	0.0436%	0.001%	0.702%
Near	0.0522%	0.281%	0.441%
Middle	0.0566%	0.149%	0.528%
Far	0.0734%	0.230%	0.885%

Liquidity Position:

Considering Daily values:

	Near	Middle	Far
Average number of contracts	15815	3320	22
Average Open Interest	3390338 7	636583 2	3988 1

For Underlying average volume = 10178467

Average number of trades = 45130

It is seen that the liquidity position is the best for the Near contracts, followed by the Middle contracts and is the worst for the Far contracts.

Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher. Far contracts have very few contracts available and have very poor liquidity position.

Hence it may be a viable option to trade in the Near contracts.

## State Bank of India

- The mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset.
- Hence, it is profitable to invest in NEAR Month Contracts as compared to Next or Far month, to earn better returns within a lesser time period.
- The returns decreased slightly but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a daily investment schedule, earning better returns at low risk.
- Even for a risk-loving investor it is advisable to take up a daily investment schedule, earning high returns at lower risk.
- As adjusted returns are negative, it's advisable to invest in Government Bonds.

Comparison is done and shown below

Type	Daily	Weekly	Monthly
Equity	-0.01350%	-0.17060%	-0.76980%
Near	0.01310%	-0.08510%	-0.92290%
Middle	0.01330%	-0.08130%	-0.92170%
Far	0.00860%	-0.09940%	-0.98970%

## Liquidity Position:

Considering Daily values:

	Near	Middle	Far
Average number of contracts	20066	3406	58
Average Open Interest	70705802	13691049	228666

For Underlying average volume = 23725077

Average number of trades = 47130

- It is seen that the liquidity position is the best for the Near contracts, followed by the Middle contracts and is the worst for the Far contracts.

- Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher.
- Far contracts have very few contracts available and have very poor liquidity position.
- Hence it may be a viable option to trade in the Near contracts.

## SAIL

### COMPARISONS:

- Volatility increases from Near, middle to Far month.
- However, the mean daily returns (both risk adjusted and risk unadjusted) have remained essentially the same from Near, Next to Far month, as well as Underlying asset with very less difference margin.
- Hence, it is profitable to invest in the underlying or near Month Contracts as compared to Next or Far month, to earn decent returns within a lesser time period.
- The returns decreased slightly but the volatility increases from Daily, Weekly to Monthly Frequency. Therefore, for a hedging investor who would like to minimize risk it is advised to take up a daily investment schedule, earning better returns at low risk.
- Even for a risk-loving investor it is advisable to take up a daily investment schedule, earning high returns at lower risk.
- As adjusted returns are negative, it's advisable to invest in t-bills.
- Comparison is done and shown below :

Type	Daily	Weekly	Monthly
Equity	-0.2722%	-1.2956%	-5.4034%
Near	-0.2777%	-1.2461%	-6.9644%

Middle	-0.2792%	-1.2496%	-6.9897%
Far	-0.2768%	-1.2385%	-7.0247%

### Liquidity Position:

Considering Daily values,

	Near	Middle	Far
Average No. of Contracts	4383	1005	13
Average Open Interest	75234689	15310033	364033

For Underlying:

Average Number of Trades = 30508

Average Traded Quantity = 19981266

- It is seen that the liquidity position is the best for the Middle contracts, followed by the Near contracts and is the worst for the Far contracts
- Based on the comparison average traded quantity of equity with the data from the futures, the liquidity position lies between middle and near contracts.
- The average number of trades of stocks are much higher than that of any futures contracts.
- Also the middle contracts have lesser open interest as compared to the Near contracts, implying more positions are being closed and trade volume is higher.

- Far contracts have very few contracts available and have very poor liquidity position.
- Hence it may be a viable option to trade in the Middle contracts.

# Contango Trends

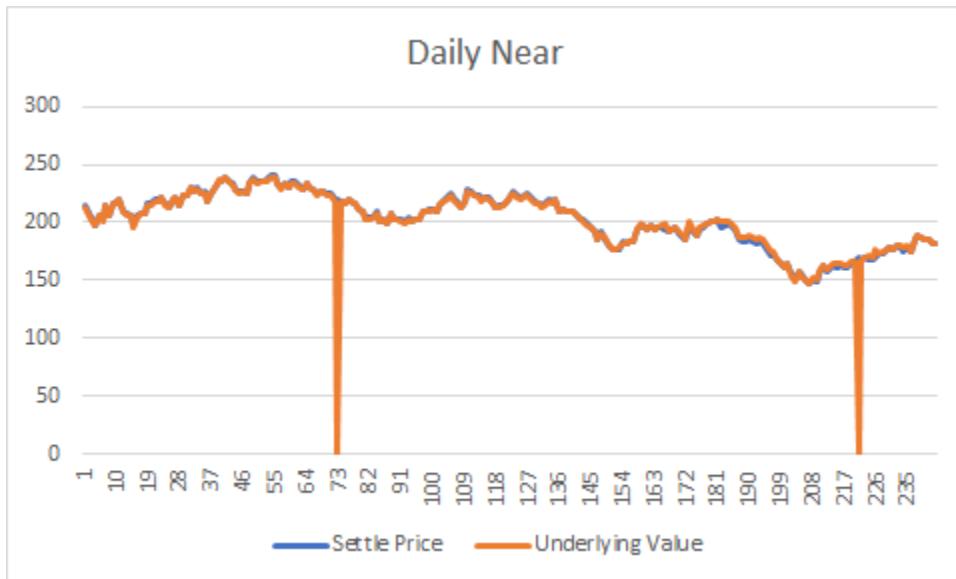
## Contango Backwardation Trends

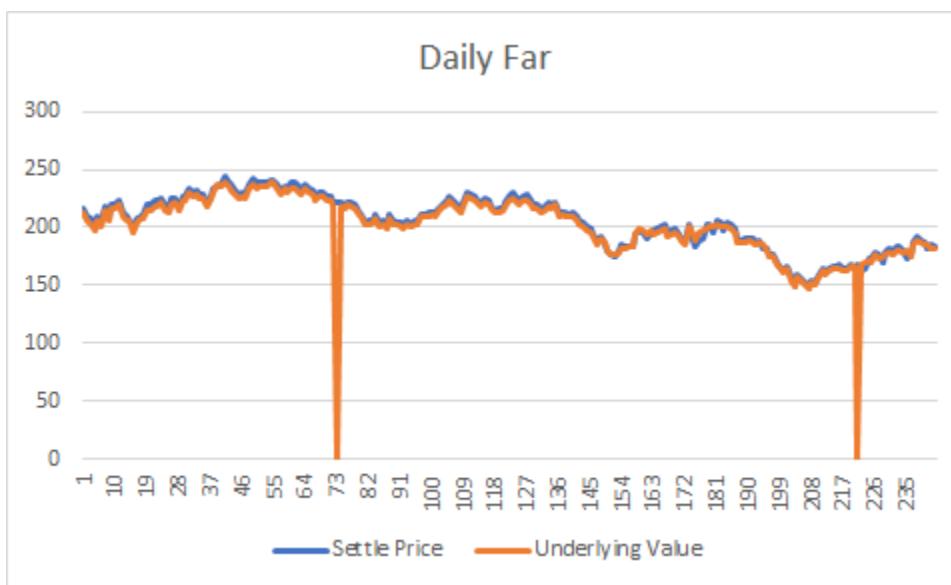
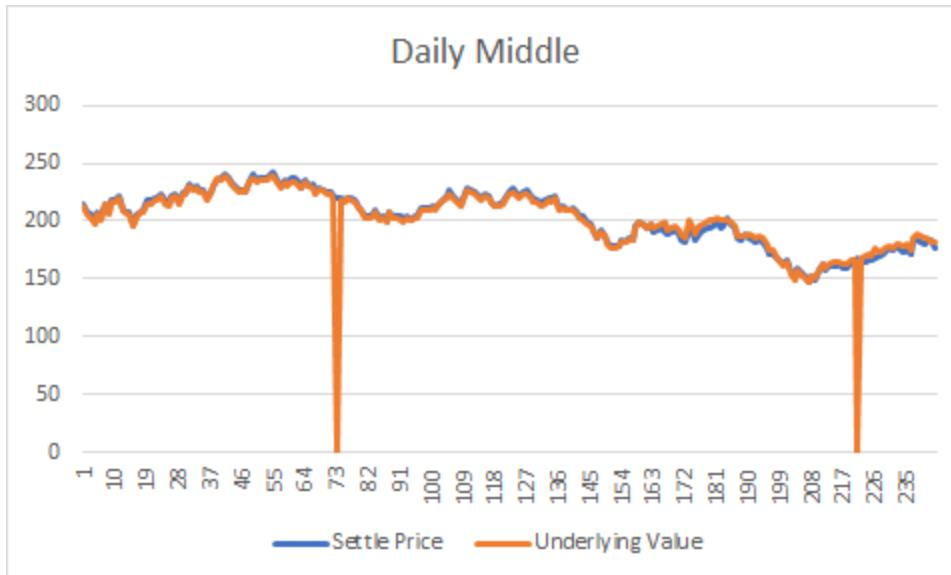
### Apollo

Contango is a situation where the futures price of a commodity is above the expected future spot price and Backwardation refers to a situation where the future spot price is below the current price. These are common in the market and are corrected by the market itself in the future.

During the period of observation, for all trading days (245) in year starting from 1st October 2018 till 30th September 2019,

- near contract is greater than underlying for 189 days.
- middle contract is greater than underlying for 233 days.
- far contract is greater than underlying for 233 days





We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

**Arvind**

**Contango** is a situation where the futures price of a commodity is above the expected future spot price and **Backwardation** refers to a situation where the future spot price is below the current price. These are common in the market and are autocorrected by the market itself in the future.

During the period of observation, for all trading days (245) in year starting from 1<sup>st</sup> October 2018 till 30<sup>th</sup> September 2019,

near contract is greater than underlying for 201 days.

middle contract is greater than underlying for 197 days.

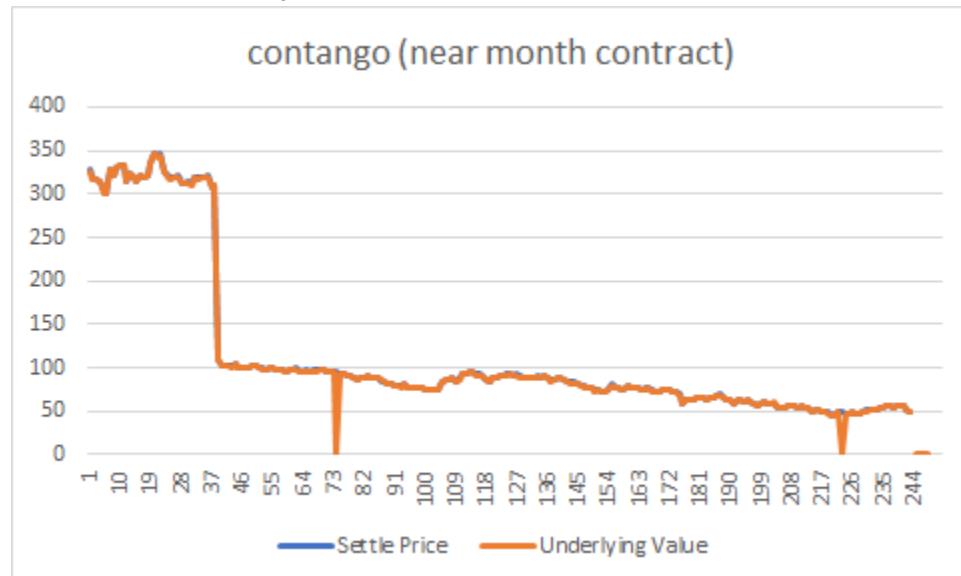
far contract is greater than underlying for 192 days

The mean prices of all the contracts across the observed period and the underlying also depicts the same behavior (Underlying: , 115.36 Near: , Middle: 120.68, Far: 129.49 (all values in rupees)), as in all the three contracts are showing a contango behavior. (Calculations for the Behavior are shown in Excel Sheet in Worked Out Futures sheets.)

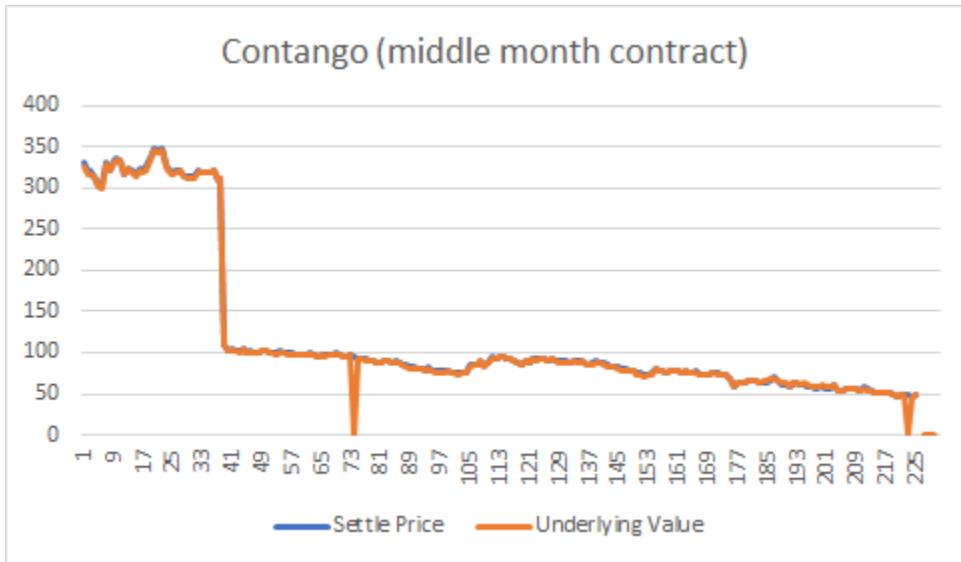
Overall, we can conclude that on an average, that there are a greater number of days when the contract prices are higher than the underlying asset prices, the contracts can be inferred to have Contango behavior.

Similarly, all other graphs can be generated. All plots in Excel sheets. Contango Charts for Near, middle and Far months on daily frequency basis also imply the same

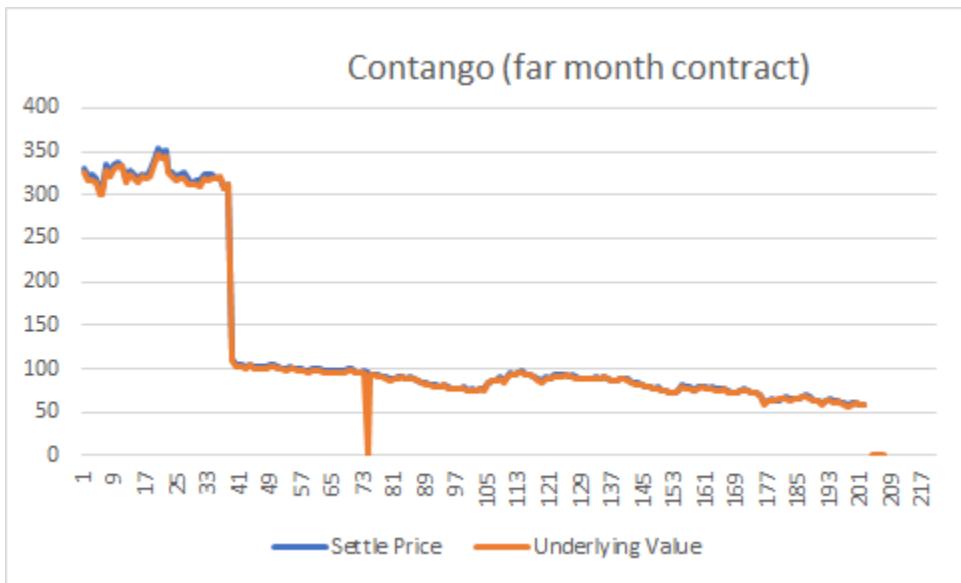
Near contract: daily



### Middle contracts: daily



### Far contracts: daily



We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

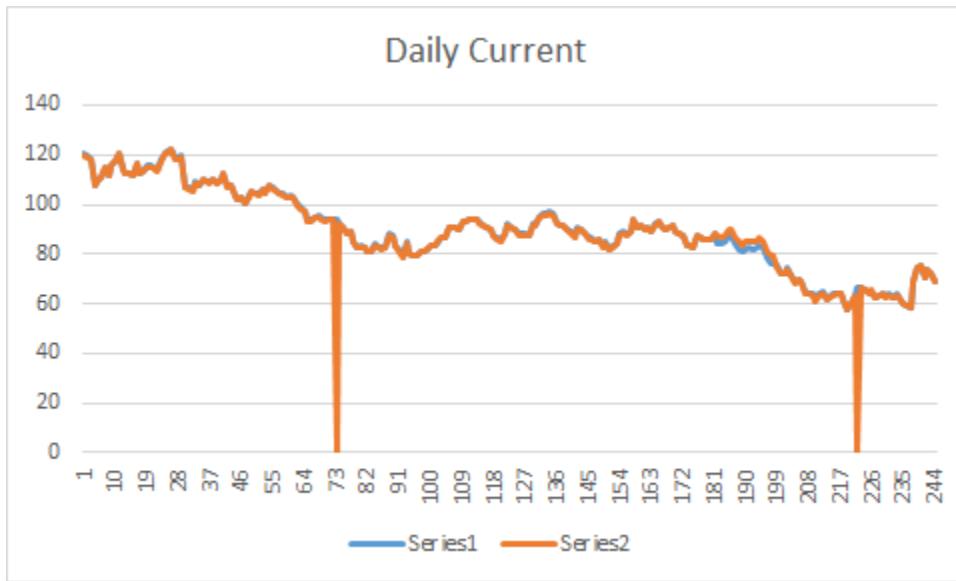
# Ashok Leyland

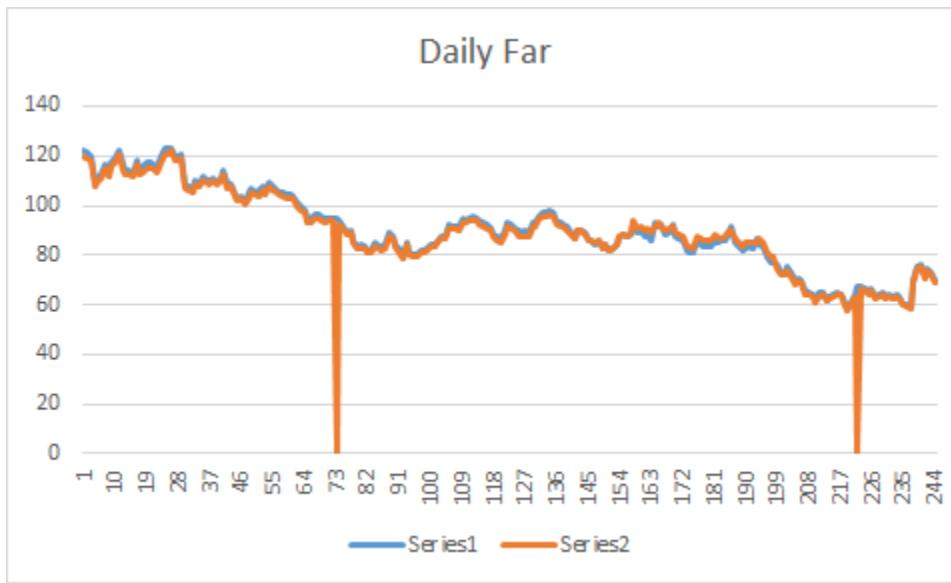
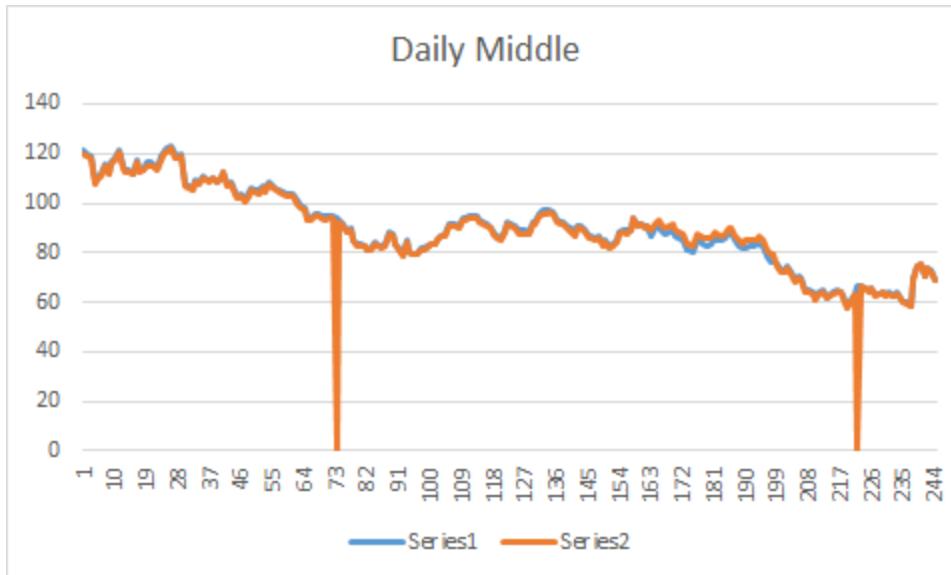
During the period of observation, for all trading days (245) in year starting from 1<sup>st</sup> October 2018 till 30<sup>th</sup> September 2019,

near contract is greater than underlying for 187 days.

middle contract is greater than underlying for 203 days.

far contract is greater than underlying for 192 days



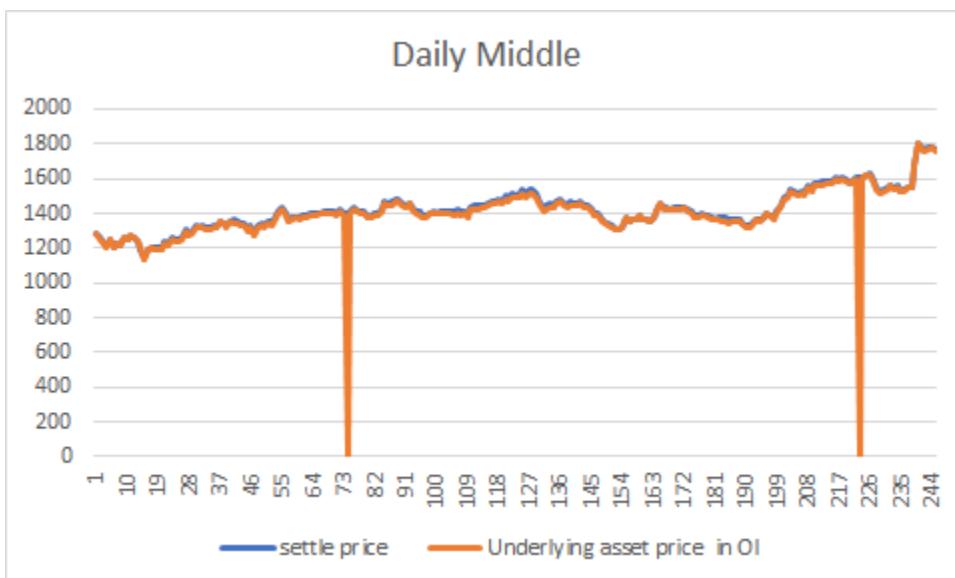
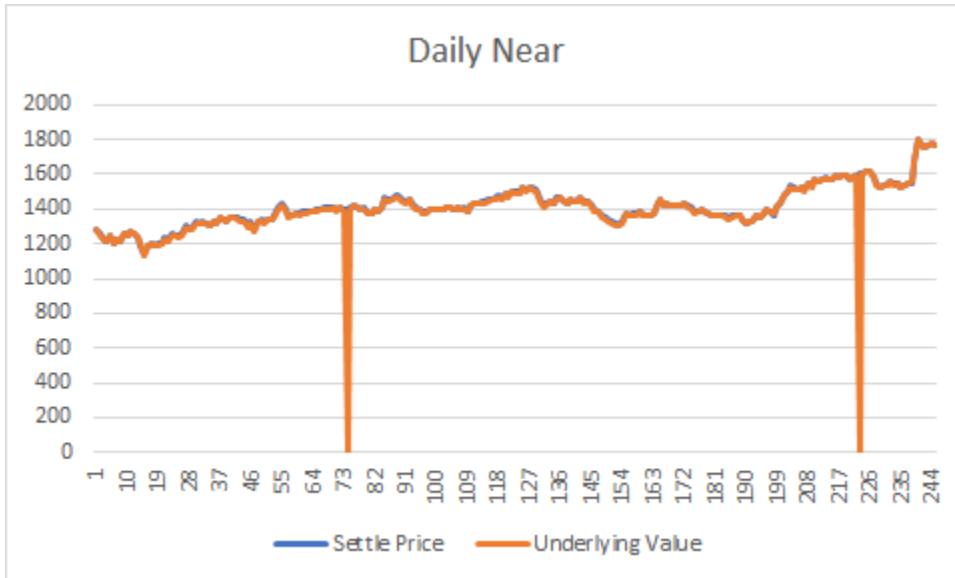


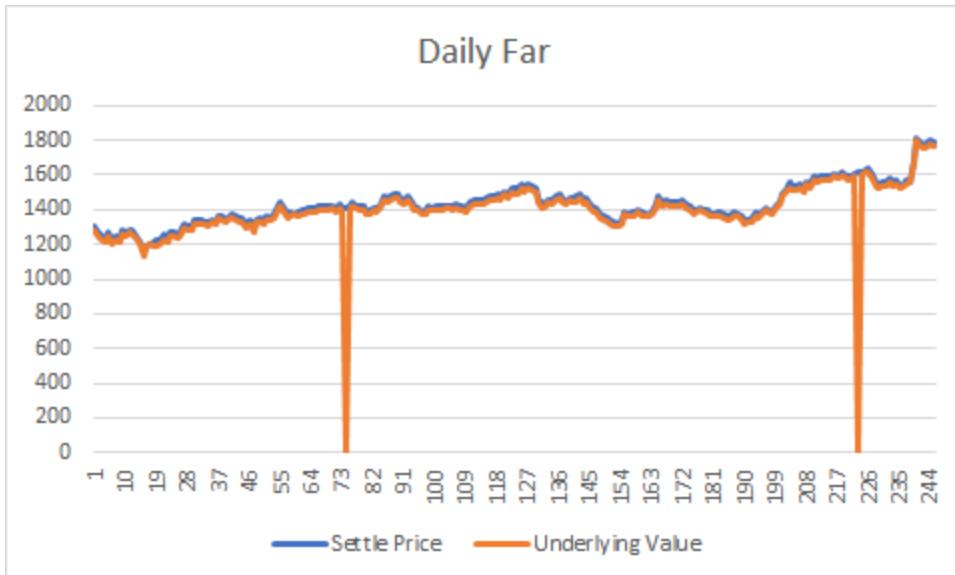
Overall, we can conclude that on an average, that there are a greater number of days when the contract prices are higher than the underlying asset prices, the contracts can be inferred to have Contango behavior. Contango Charts for Near, middle and Far months on daily frequency basis also imply the same

## Asian Paints

During the period of observation, for all trading days (245) in year starting from 1<sup>st</sup> October 2018 till 30<sup>th</sup> September 2019,

- near contract is greater than underlying for 199 days.
- middle contract is greater than underlying for 243 days.
- far contract is greater than underlying for 243 days





We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

## Auropharma

**Contango** is a situation where the futures price of a commodity is above the expected future spot price and **Backwardation** refers to a situation where the future spot price is below the current price. These are common in the market and are autocorrected by the market itself in the future.

During the period of observation, for all trading days (245) in year starting from 1<sup>st</sup> October 2018 till 30<sup>th</sup> September 2019,

near contract is greater than underlying for 180 days.

middle contract is greater than underlying for 239 days.

far contract is greater than underlying for 238 days

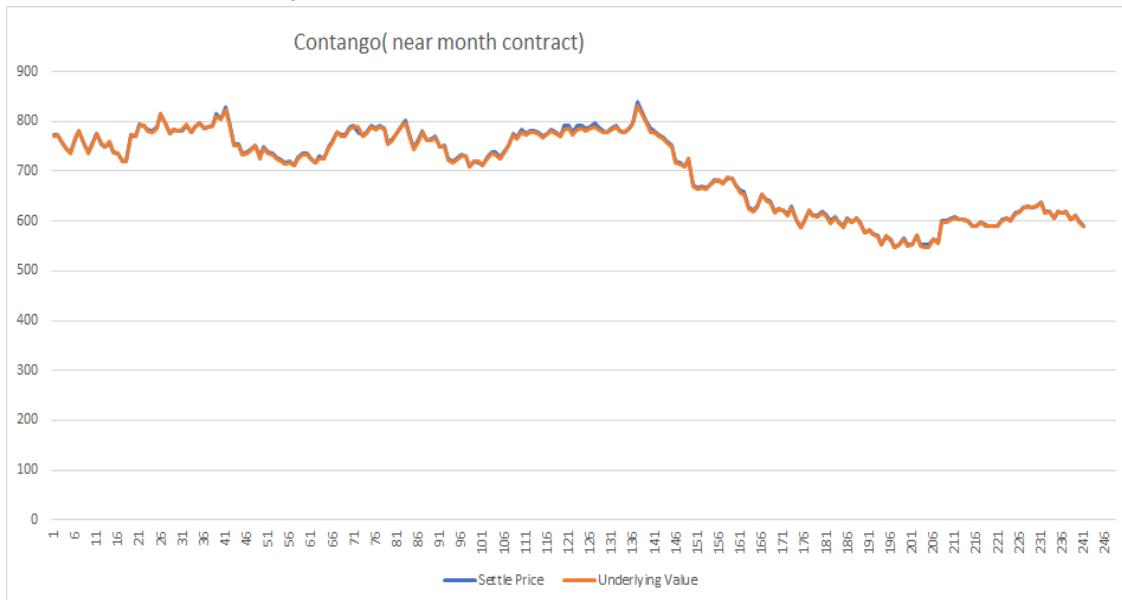
The mean prices of all the contracts across the observed period and the underlying also depicts the same behavior (Underlying: 704.69, Near: 706.56, Middle: 709.99, Far: 714.33 (all values in rupees)), as in all the three contracts are showing a contango behavior. (Calculations for the Behavior are shown in Excel Sheet in Worked Out Futures sheets.)

Overall, we can conclude that on an average, that there are a greater number of days when the contract prices are higher than the underlying asset prices, the contracts can be inferred to have Contango behavior.

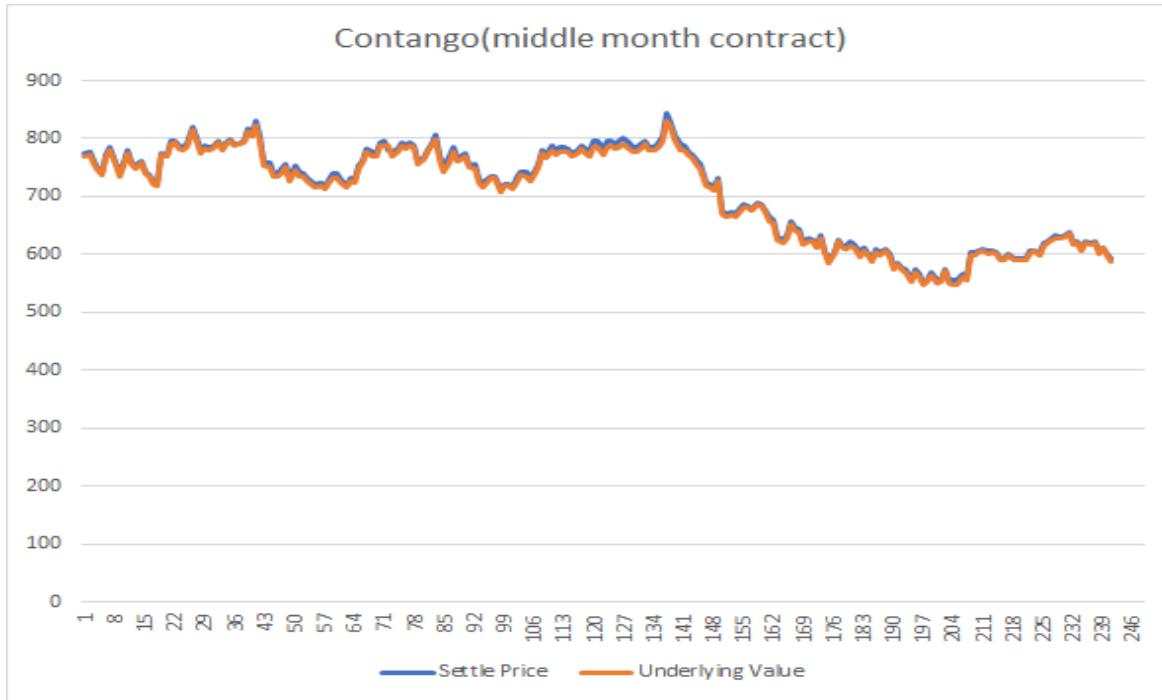
Similarly, all other graphs can be generated. All plots in Excel sheets.

Contango Charts for Near, middle and Far months on daily frequency basis also imply the same

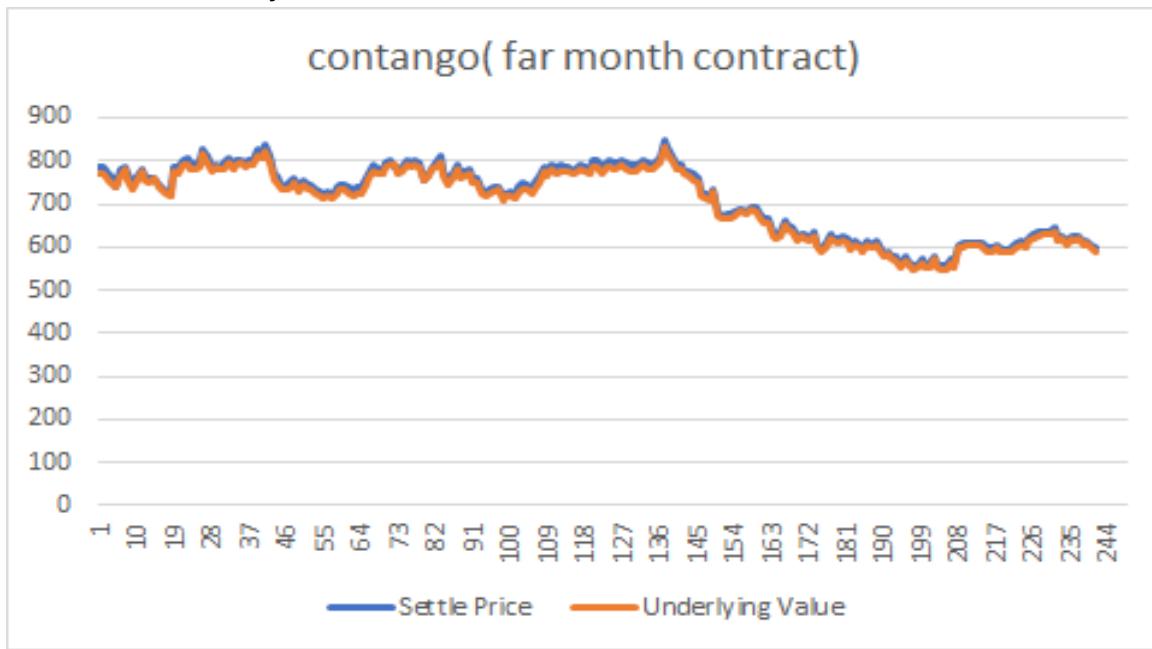
### Near contracts: daily



### Middle contracts: daily



### Far contracts: daily

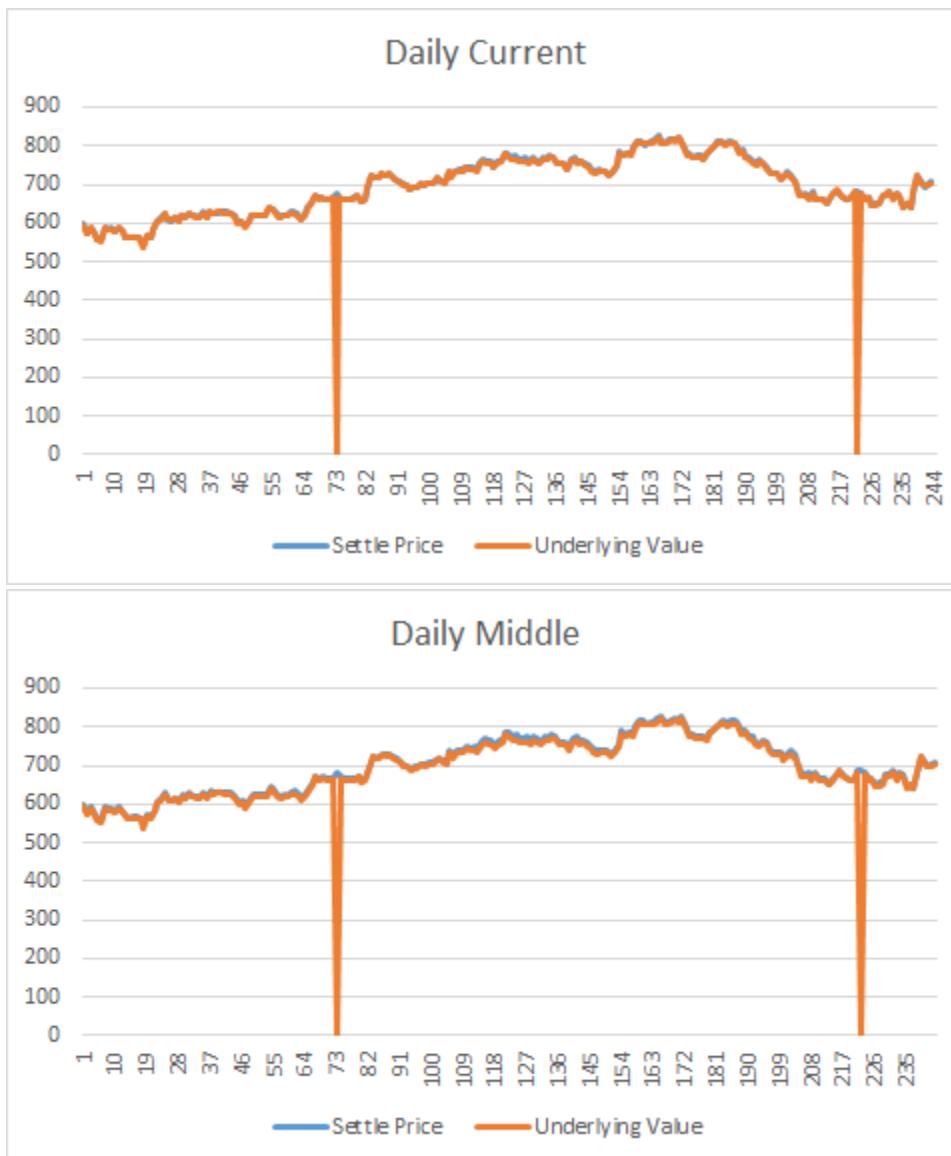


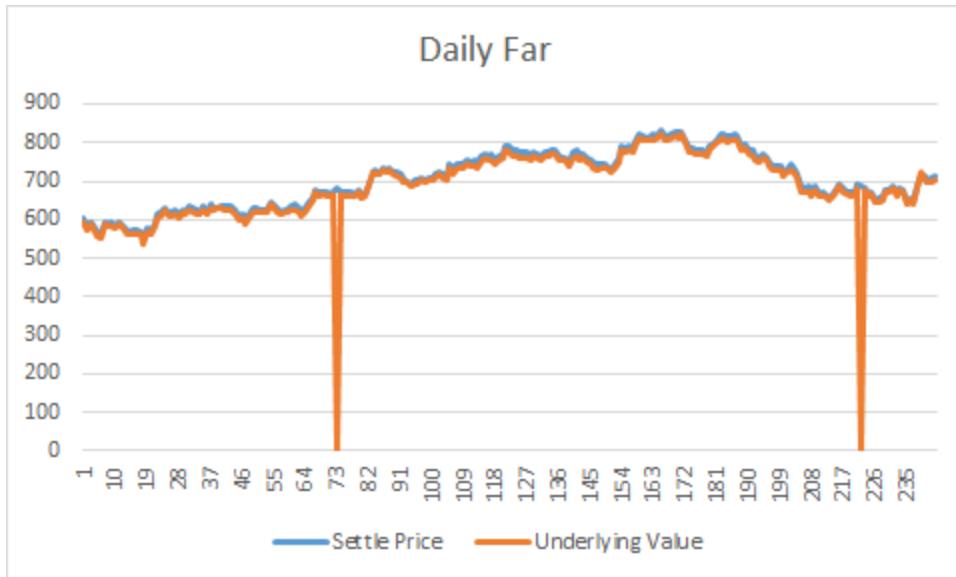
We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

## Axis Bank

Contango is a situation where the futures price of a commodity is above the expected future spot price and Backwardation refers to a situation where the future spot price is below the current price. These are common in the market and are corrected by the market itself in the future.

During the period of observation, for all trading days (245) in year starting from 1st October 2018 till 30th September 2019,





We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

During the period of observation, for all trading days (245) in year starting from 1<sup>st</sup> October 2018 till 30<sup>th</sup> September 2019,

near contract is greater than underlying for 197days.

middle contract is greater than underlying for 239 days.

far contract is greater than underlying for 239 days

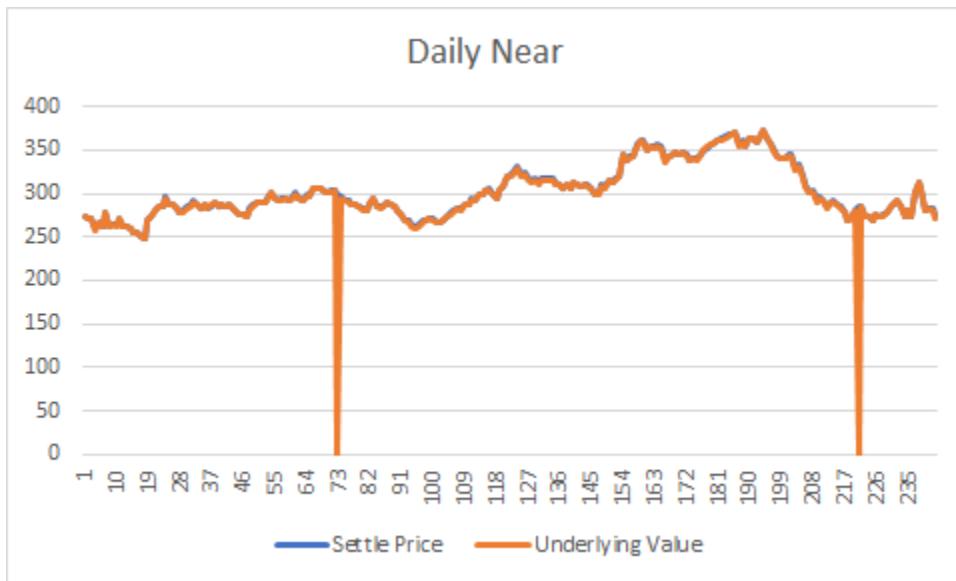
We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

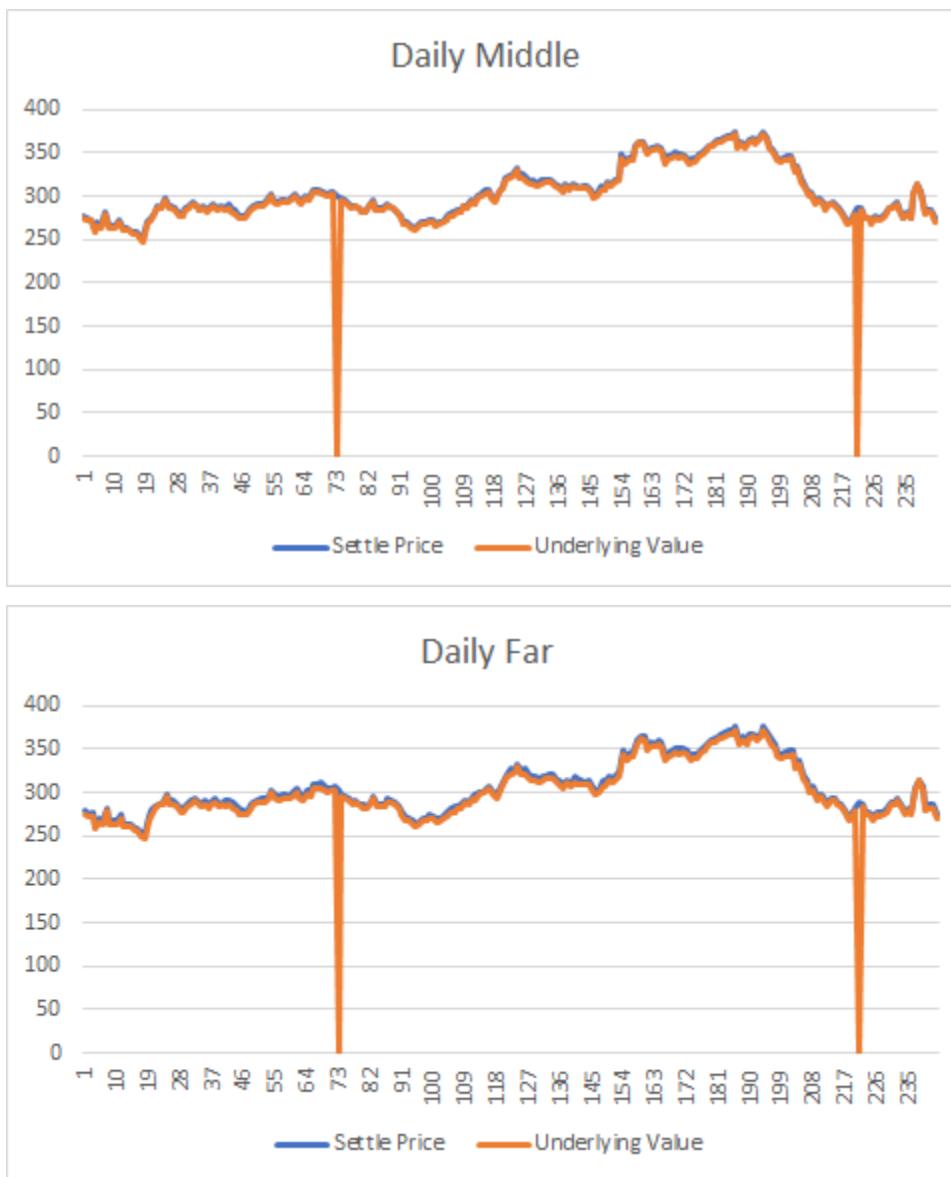
## State Bank of India

Contango is a situation where the futures price of a commodity is above the expected future spot price and Backwardation refers to a situation where the future spot price is below the current price. These are common in the market and are corrected by the market itself in the future.

During the period of observation, for all trading days (245) in year starting from 1st October 2018 till 30th September 2019,

- near contract is greater than underlying for 138 days.
- middle contract is greater than underlying for 242 days.
- far contract is greater than underlying for 242 days





We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

## SAIL

**Contango** is a situation where the futures price of a commodity is above the expected future spot price and **Backwardation** refers to a situation where the

future spot price is below the current price. These are common in the market and are autocorrected by the market itself in the future.

During the period of observation, for all trading days (245) in year starting from 1<sup>st</sup> October 2018 till 30<sup>th</sup> September 2019,

near contract is greater than underlying for 180 days.

middle contract is greater than underlying for 211 days.

far contract is greater than underlying for 229 days

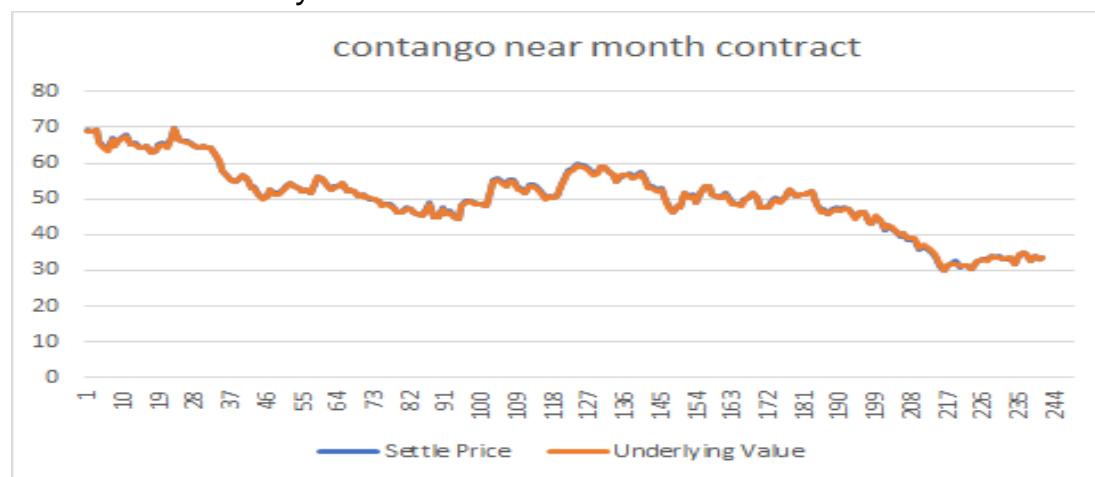
The mean prices of all the contracts across the observed period and the underlying also depicts the same behavior (Underlying: 50.17, Near: 50.55, Middle: 50.77, Far: 51.11(all values in rupees)), as in all the three contracts are showing a contango behavior. (Calculations for the Behavior are shown in Excel Sheet in Worked Out Futures sheets.)

Overall, we can conclude that on an average, that there are a greater number of days when the contract prices are higher than the underlying asset prices, the contracts can be inferred to have Contango behavior.

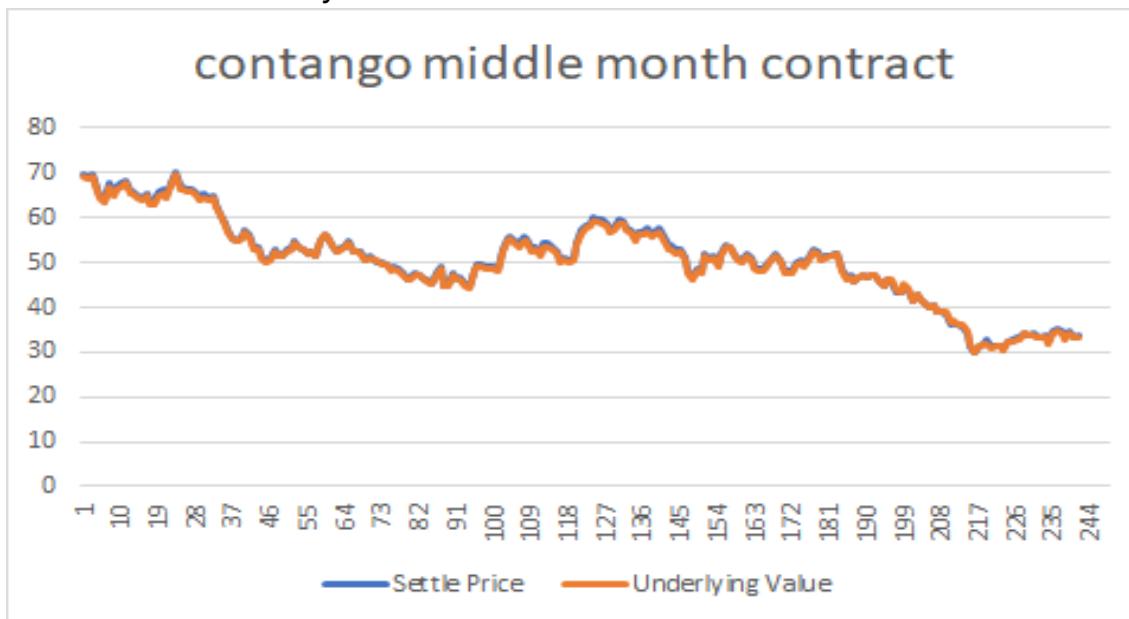
Similarly, all other graphs can be generated. All plots in Excel sheets.

Contango Charts for Near, middle and Far months on daily frequency basis also imply the same

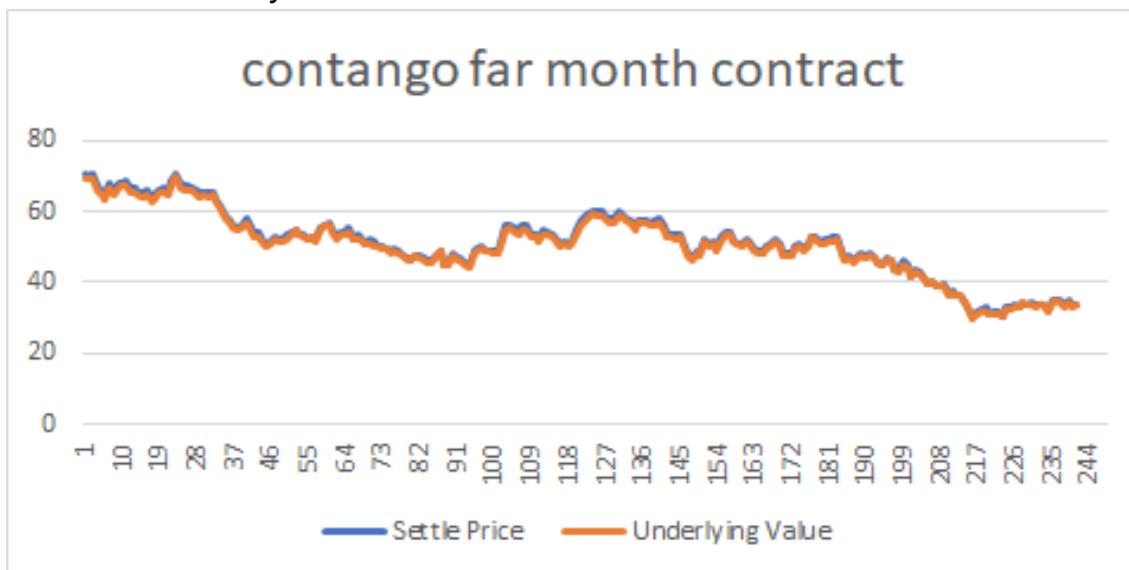
Near contracts: daily



### Middle contracts: daily



### Far contracts: daily



We can see that the three contracts are showing a contango behavior as for majority of the assessed time period Futures price is greater than that of the underlying asset. These prices will converge to equal values in some time in the future.

# Frequency Sequence

Frequency significance:

- The frequency in itself shouldn't matter as per the theory of stock prices being completely random (Random Walk Theory) and efficient market hypothesis.
- On average the return would be the same theoretically ignoring the transaction costs of each trade.
- The frequency is however important to the investor as the calculation of the Sharpe ratio depends on the standard deviation which depends on the frequency of duration.
- Also, the frequency does matter because if we pick daily frequency, we get much more statistical data which improves the reliability of information.
- If frequency were to be taken into account, for positive returns it is better to invest on a monthly basis as frequency compounded on a monthly basis is greater. Based on the same principle, if the returns are negative, it is better to invest on a daily basis.
- The returns with respect to the frequency (daily, weekly and monthly) vary very much. The daily returns are least volatile, whereas monthly returns are relatively more variable, at least in terms of the direction.
- The Sharpe ratios of the underlying as well as the contract also depict the less variability of the daily returns.

# **Equity Options Instrument:**

## **Binomial option pricing method:**

Please Check the **EXCEL worksheet of Option Pricing** for all calculations.

Below is the procedure for the pricing related calculation (s).

All near month contracts are chosen from 1 july 2019 to 26 sept 2019

Call option (CE) and put option (PE) strike price(s) are chosen at random from the available values and underlying values for the same are taken down.

The returns of the underlying asset are calculated on a daily basis for a 3-month period (we did this for April, May, & June months in 2019), and the volatility of the returns (daily) is found (standard deviation of returns) from the data.

yearly volatility of return is calculated from the daily volatility by multiplying daily volatility with square root of no. of trading days (252).

Mean daily risk free rate is used for calculating the prices

from this data, possible up factors and down factors returns over a period of 1 month are found using

$$U = e^{(rf * \sqrt{T})} \text{ and } D = 1/U$$

We considered a One-step Binomial tree (option is exercisable only at the end of term) for a duration of 1 month for july, august and september months.

Using standard option value calculation based on binomial tree method, we calculated the option value of the chosen call option and put option and compared these with actually trading values on the exchange.

## **Assumptions involved in the binomial pricing model:**

1. Constant (risk free, monthly compounded) interest rate  $rf$
2. No transaction costs which is not true at all times. There are always transaction costs involved in the exchange for any sized transaction.

3. Market is completely liquid, which may not be true during certain times.
4. No dividend payments, which cannot be ignored as stock dividends and stock splits are adjusted by exchange from time to time.

**Action to be taken if arbitrage opportunity is found:**

- A) If option is priced higher than theoretically calculated price, it means that the option is overpriced and over time, it would come down to its true value. So, to get arbitrage opportunity:

Take short position in the option.

Long(buy) the underlying by borrowing the extra amount required than premium due to short position in the option at risk free rate.

- B) option is priced at a price lower than theoretically calculated price, it means that the option is underpriced and over time, it would go up to its true value. So, to get arbitrage opportunity:

Short(sell) the underlying.

Take a long position in the option using some amount obtained by shorting the underlying and invest the remaining amount at risk free rate.

## Apollo

Call Option



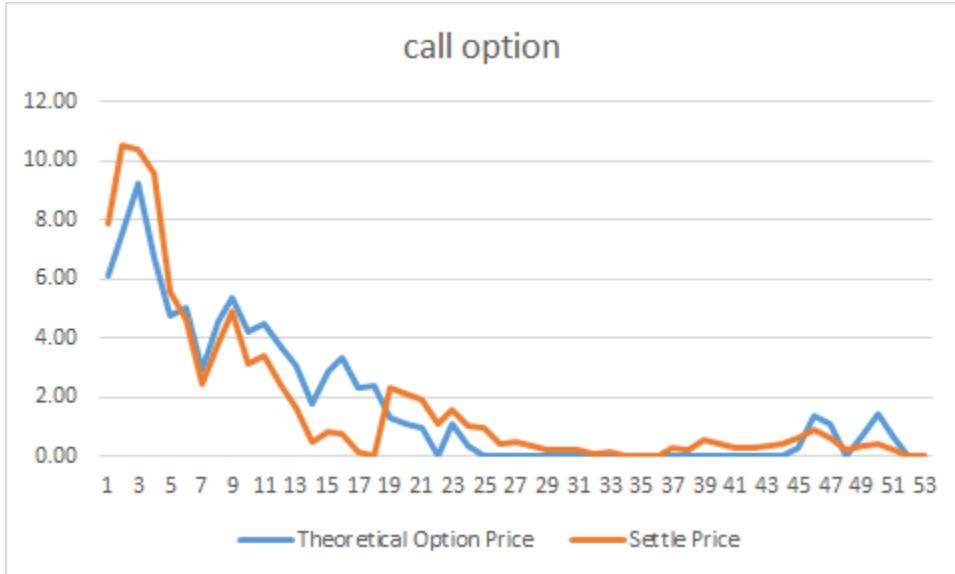
## Put Option



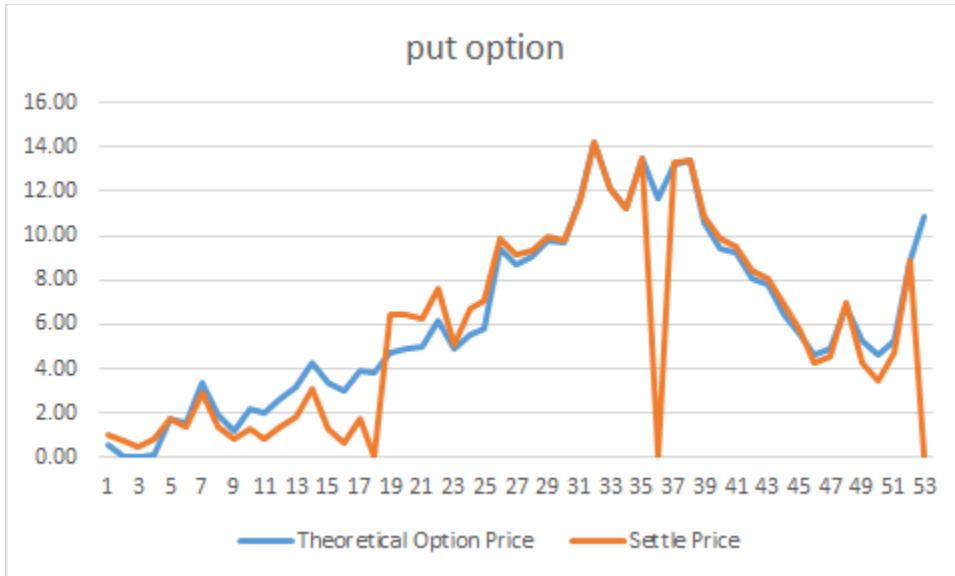
The market makes mistakes in pricing and takes time to correct itself. Hence the theoretical prices of the options and the market prices are different. The difference in these prices present opportunities for arbitrage. This opportunity can be utilized by any investor after taking transaction costs into account. These opportunities must be availed quickly as the prices converge to a common value once the market corrects itself.

# Arvind

## Call option



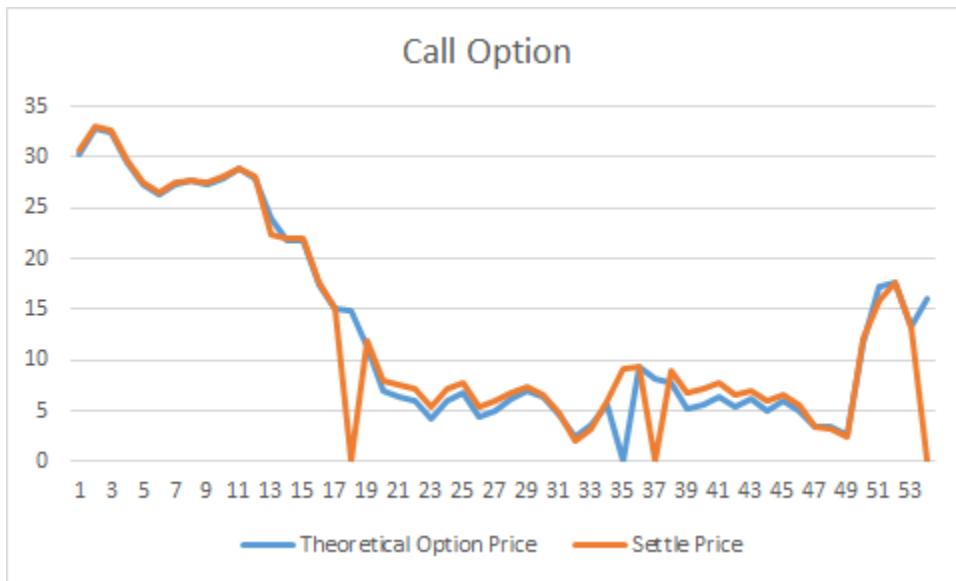
## Put option



As seen, the theoretical prices closely follow the actual prices. This follows the principles that market is wrong but usually corrects itself over time. Arbitrage opportunity exists and can be leveraged to clock returns.

## Ashok Leyland

The theoretical prices and market prices using the binomial asset pricing model, have been compared below for both the options:

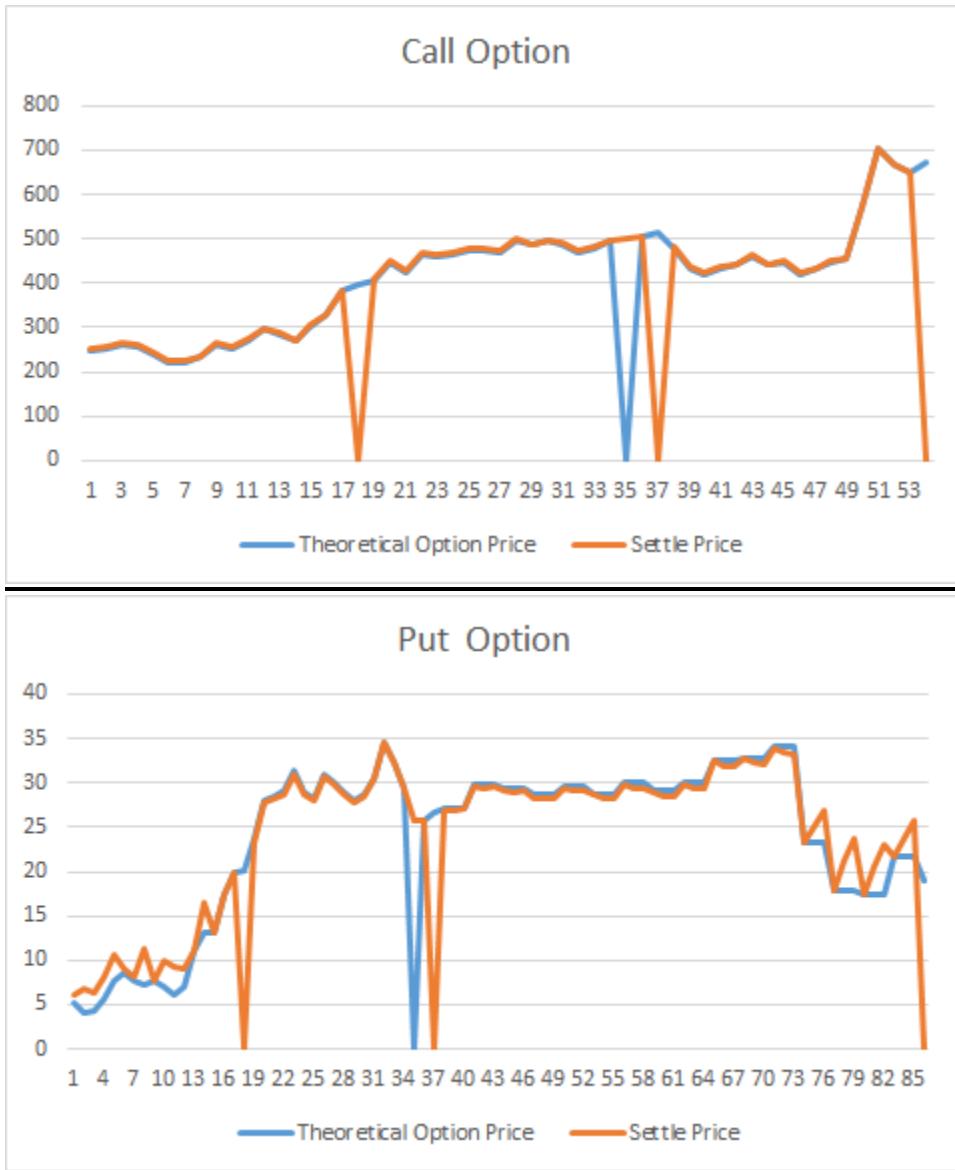


## Analysis

The market makes mistakes in pricing and takes time to correct itself. Hence the theoretical prices of the options and the market prices are different. The difference in these prices present opportunities for arbitrage. This opportunity can be utilized by any investor after taking transaction costs into account. These opportunities must be availed quickly as the prices converge to a common value once the market corrects itself.

# Asian Paints

The comparison between the theoretical prices from the Binomial asset pricing model and the market prices are shown below:



## Analysis

As seen above, the theoretical prices closely follow the actual prices. This follows the principles that market is wrong but usually corrects itself over time. Arbitrage opportunity exists and can be leveraged to clock returns. These can be taken utilised by longing the underpriced asset and shorting the overpriced asset. But as an intelligent investor, we should always take transaction costs into account before arriving on the judgement that an arbitrage opportunity exists.

# Aurobindo Pharma

Call option



put option



The market makes mistakes in pricing and takes time to correct itself. Hence the theoretical prices of the options and the market prices are different. The difference in these prices present opportunities for arbitrage. This opportunity can be utilized by any investor after taking transaction costs into account. These opportunities must be availed quickly as the prices converge to a common value once the market corrects itself.

# Axis Bank

## State Bank of India

Call



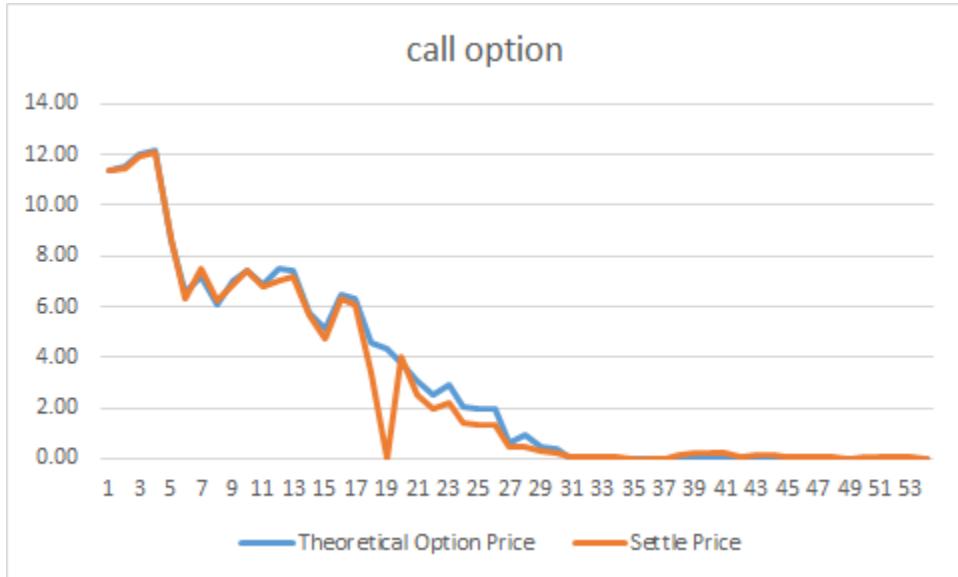
Put



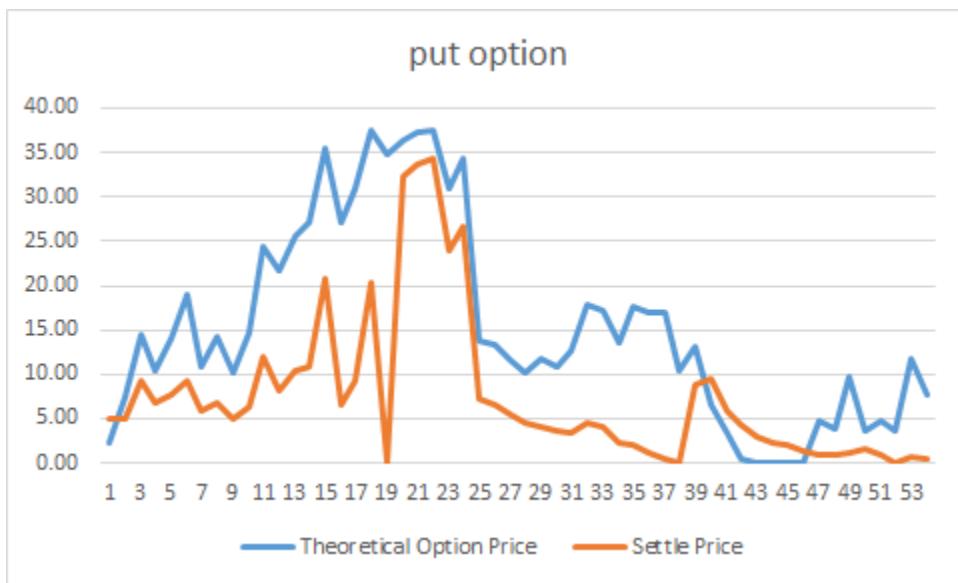
As seen, the theoretical prices closely follow the actual prices. This follows the principles that market is wrong but usually corrects itself over time. Arbitrage opportunity exists and can be leveraged to clock returns.

# Steel Authority of India

Call option



Put option



The market makes mistakes in pricing and takes time to correct itself. Hence the theoretical prices of the options and the market prices are different. The difference in these prices present opportunities for arbitrage. This opportunity can be utilized by any investor after taking transaction costs into account. These opportunities must be availed quickly as the prices converge to a common value once the market corrects itself.



## Conclusion

### Apollo

Apollo tyres was not performing well and company failed to meet the expectations of investors and is reflected in the returns of its underlying equity instruments which are showing a negative return on daily, weekly and monthly basis. Futures are also showing negative returns only. Since both equity and futures show negative returns it's not better to invest in Apollo tyres. Due to volatility, the minimal positive returns of daily of the contracts got consumed up and led to negative returns across all of the instruments. Hence it is advisable to trade in futures, on a daily basis for minimizing the losses. Regarding the options of the company, theoretical prices were found using binomial tree model and a few assumptions. The theoretical prices were almost the same as the traded prices and some leverage existed for very short durations. The final report presented a summarised analysis of returns on equity and derivatives related to the company.

### Asian Paints

Asian Paints has proven to be a very profitable company as it is able to provide excess returns over the risk free rate for its equity on a daily, weekly and monthly basis. Furthermore its returns for its futures are also steadily positive for the various periods of maturity. These contracts have adequate liquidity position for investors to close out their positions as per their requirements. From comparison of futures and spot prices we see that it follows a normal market trend (contango) aside from some deviations. Both equity and futures are good investment avenues for an average risk-averse investor. The binomial pricing model shows that theoretical and actual prices are almost equal except for deviations at some points.

### SAIL

SAIL has not performed well and given a negative Return to the investors of the company as it is able to provide less returns over the risk free rate for its equity on a daily, weekly and monthly basis. Furthermore its returns for its futures are also

negative for the various periods of maturity and to minimize risk its better to invest in daily futures as it gives less amount of loss as compared to the compounding monthly futures. These contracts have adequate liquidity position for investors to close out their positions as per their requirements. From comparison of futures and spot prices we see that it follows a normal market trend( contango) aside from some deviations. Both equity and futures are not a very good investment avenues for an average risk-averse investor. The binomial pricing model shows that theoretical and actual prices match at almost all points except for some deviations.

## ARVIND

Since the Arvind is able to provide less return over the risk free rate for its equity on daily, weekly and monthly basis, let us conclude that Arvind has not performed well and failed to fulfill the investors expectations. Furthermore its returns for its futures are also declining for the various periods of maturity. Monthly return show more loss compared to daily and weekly returns, so it is better not to invest for monthly basis. These contracts have adequate liquidity position for investors to close out their positions as per their requirements. From comparison of futures and spot prices we see that it follows a normal market trend( contango) aside from some deviations. Both equity and futures are not performing well, so this is not a good investment avenues for an average risk-averse investor. The binomial pricing model shows that theoretical and actual prices are almost equal except for deviations at some points.

## Ashok Leyland

Ashok Leyland has not made its investors very proud and has not performed very well except in terms of weekly equity and it's been an off performer even in terms of the Futures Markets with the least amount of risk in the daily futures contracts suggesting that the compounding monthly futures give a huge loss to the investor. It is seen that the liquidity position is the best for the Near contracts, followed by the Middle contracts and is the worst for the Far contracts from comparison of futures and spot prices we see that it follows a normal market trend( contango) aside from some deviations. It can be seen that it will be better to invest in other companies than Ashok Leyland.

## Auropharma

The company was not able to meet the expectations of investors and is reflected in the returns of its underlying equity instruments (clear from the sharpe ratio plot) and futures instruments, which are not only less than government securities (on an average) but also negative. It is clear from the reports that one would benefit more, if he invests in other companies securities than the ones related to this company. This was true for all frequencies of investment and across all possible instruments. The liquidity position is better in case of near contracts, when compared to other contracts. Regarding the options of the company, theoretical prices were found using binomial tree model and a few assumptions. The theoretical prices were almost the same as the traded prices and some leverage existed for very short durations. The final report presented a summarised analysis of returns on equity and derivatives related to the company.

## Axis Bank

Axis Bank has been a star performer giving positive trends in both the equity markets as well as futures markets and it is shown by the positive slopes in the sharpe ratio graphs throughout, giving a decent and better amount of profits in all trends. It is seen that the liquidity position is better for the near contracts, followed by the Middle contracts and is the worst for the Far contracts. Since it has low uncertainty in daily compared to monthly and weekly ,it is better to trade on a daily basis. Regarding the options of the company, theoretical prices were found using binomial tree model and a few assumptions. The final report presented a summarised analysis of returns on equity and derivatives related to the company.

## State bank of India

The company was not able to meet the expectations of investors and is reflected in the returns of its underlying equity instruments which are not only less than government securities (on average) but also negative (clear from the sharpe ratio plot). It is not the case for futures contracts of the company and is clear from the reports that one would benefit, if he invests in the futures securities of the company than in the underlying equity. This is true for only daily frequency of investment and across all possible instruments. Due to volatility, the minimal positive returns of daily of the contracts got consumed up and led to negative returns across all of the instruments. Hence it is advisable to trade in futures, on a daily basis. Regarding the options of the company, theoretical prices were found using binomial tree model and a few assumptions. The

theoretical prices were almost the same as the traded prices and some leverage existed for very short durations. The final report presented a summarised analysis of returns on equity and derivatives related to the company.

## References

The following websites were referred

- <https://in.finance.yahoo.com/>
- <https://nseindia.com/>
- <https://www.wikipedia.org/>
- <https://www.apollotyres.com/en-in/car-suv-van/tyre-finder/>
- <https://www.arvind.com/>
- <https://www.aurobindo.com/>
- <https://www.onlinesbi.com/>
- <https://www.sail.co.in/>

- <https://www.axisbank.com/>
- <https://www.ashokleyland.com/en/web/ashokleyland/home>
- <https://www.asianpaints.com/>
- <https://www.moneycontrol.com/>

Options, Futures, and Other Derivatives Book by John C. Hull