

# Trading Opportunities in Indian Equity Futures: An Examination of Arbitrage Function

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**Abstract:** The Indian futures market has grown substantially since the introduction of derivatives trading in 2000 by the National Stock Exchange (NSE). The market offers contracts in various asset classes, including equities, commodities, and currencies. While arbitrage opportunities exist due to market inefficiencies, the speed and efficiency of the market have been improving, leading to fewer arbitrage opportunities over time as high-frequency traders and algorithmic trading systems become more prevalent. Through this paper an attempt has been made to identify the trading opportunities available in Indian Equity futures market through the examination of arbitrage process. The study used near month futures contracts of top five companies in Nifty 50 Index based on their market capitalisation from January 2023 to June 2024. The arbitrage opportunities has been checked using spot parity theorem and trading opportunities has been identified using RSI and Bollinger bands. The results of spot parity theorem indicate adequate arbitrage opportunities for traders of the five companies.

**Keywords:** Arbitrage, stock Futures, Derivatives, RSI, Bollinger bands, Indian futures market

## I. INTRODUCTION

Arbitrage in the Indian futures market involves exploiting price discrepancies between different markets or instruments to earn risk-free profits. This is often achieved by taking simultaneous positions in the spot market and futures market. Arbitrageurs monitor price differences, and when these differences exceed transaction costs, they execute trades to profit from the temporary inefficiencies. Arbitrage plays a crucial role in making markets more efficient by aligning prices across various markets and reducing any discrepancies over time.

Arbitrage refers to the practice of taking advantage of price differentials between two or more markets to generate risk-free profit. In the context of the Indian futures market, arbitrage involves simultaneously buying and selling equivalent instruments in different markets or forms (spot and futures) to exploit price discrepancies. The arbitrage mechanism works on the premise that futures prices and spot prices should converge at the expiration of the contract. When there is a divergence, arbitrageurs step in to take positions that eventually bring the prices in alignment, restoring market efficiency. In the context of the Indian futures market, arbitrage involves exploiting the price differences between the spot market (cash market) and the futures market or among different futures contracts for the same underlying asset on various exchanges. Arbitrage helps in aligning the price differences between markets, improving market efficiency.

Arbitrage strategies in the Indian futures market can be broadly classified into cash-and-carry arbitrage, reverse cash-and-carry arbitrage, and index arbitrage. Cash-and-carry arbitrage occurs when an arbitrageur buys the asset in the spot market and sells it in the futures market. Conversely, in reverse cash-and-carry arbitrage, an arbitrageur sells the asset in the spot market and buys it in the futures market. Index arbitrage involves trading on the price differences between index futures and the underlying basket of stocks that make up the index.

The Indian futures market has grown substantially since the introduction of derivatives trading in 2000 by the National Stock Exchange (NSE). The market offers contracts in various asset classes, including equities, commodities, and currencies. While arbitrage opportunities exist due to market inefficiencies, the speed and efficiency of the market have been improving, leading to fewer arbitrage opportunities over time as high-frequency traders and algorithmic trading systems become more prevalent. With the present study an attempt has been made to examine the arbitrage opportunities in Individual stock futures in India. The paper uses spot parity theorem and measures of RSI and Bollinger bands to find out arbitrage opportunities for top five companies trading in NSE stock futures based on market capitalisation from 1<sup>st</sup> January 2023 to 30<sup>th</sup> June 2024.

## II. REVIEW OF LITERATURE

Research on arbitrage in the Indian futures market provides insights into the profitability, efficiency, and market dynamics in response to arbitrage opportunities.

[2] examined the efficiency of the Indian futures market by analyzing the price discovery process. The authors concluded that the futures market significantly contributes to price discovery, although short-term inefficiencies present arbitrage opportunities. Furthermore, [4] assessed the relationship between the spot and futures prices and concluded that arbitrage opportunities arise due to temporary mispricing in the market, though they are corrected quickly due to the market's growing efficiency. [1] explored the profitability of cash-and-carry arbitrage in the equity derivatives market, finding that arbitrageurs can earn risk-free profits when the cost of carry deviates from the theoretical pricing model. However, the study also noted that transaction costs, liquidity constraints, and margin requirements limit the scalability of these strategies. Similarly, [6] examined reverse cash-and-carry arbitrage in the Indian commodity futures market, highlighting its potential for risk-free profit under certain market conditions. The study found that reverse cash-and-carry arbitrage is more prevalent in commodity markets with volatile price movements. Index arbitrage has been a focus of research in the Indian context as well. [7] investigated the relationship between Nifty index futures and the underlying

stocks and found that mispricing between the index and the futures contract creates arbitrage opportunities. However, their research also indicated that index arbitrage has become less profitable over time as algorithmic trading systems correct price inefficiencies almost instantaneously. [5] analyzed the role of high-frequency traders in eliminating arbitrage opportunities. The authors found that technological advancements and the adoption of algorithmic trading strategies have reduced the frequency and magnitude of arbitrage profits as market participants react faster to price discrepancies.

Though, there are various studies identifying arbitrage opportunities, studies based on individual stock futures are comparatively limited and trading opportunities are less explored. Thus, the present study made an attempt to identify the trading opportunities available in Indian Equity futures market through the examination of arbitrage process.

## III. DATA & METHODOLOGY

For the purpose of the study, the data used were near month futures contracts of top five companies in Nifty 50 Index based on their market capitalisation from November 2023 to June 2024 as provided in Table 3.1. Data used for the study consists of near month futures contracts of daily data as they found to have more tradability than mid and far month contracts.

price and expected futures price. The spot parity theorem explains the expected futures price as follows:

$$F_t = S(1 + r)^t$$

Where, 'F' refers to the futures price, 'S' refers to the spot price, 'r' refers to risk free return and 't' refers to number of periods to contract maturity. For the purpose of study, the risk-free rate of return was assumed to be 5 per cent with continuous compounding. The significant but less than zero values of arbitrage profits indicate the mispricing between spot and futures market where futures price is comparatively lower than spot price in which situation an arbitrageur can make super normal profits by way of entering into long position in futures market and selling the same in spot market. If the arbitrage profits show significant and more than zero values of arbitrage profits indicates the mispricing between spot and futures market where futures price is comparatively higher than spot price in which situation an arbitrageur can make super normal profits by way of entering into short position in futures market and going long for same in spot market [3]. The results of arbitrage profits based on spot parity theorem are as follows:

**Table 3.1 Companies Based on Market Capitalisation**

Company	Industry	Market capitalisation (Cr.)
Reliance Industries	Conglomerate	1839431.45
Tata Consultancy Services	IT Services	1491755.57
HDFC Bank	Banking	1283382.45
Bharati Airtel	Telecommunications	1023308.67
ICICI Bank	Banking	891107.5

Source:

<https://www.screener.in/screens/599148/companies-by-market-cap/>

For the purpose of study, the simple spot parity theorem was employed to identify the mispricing between actual futures

**Table 3. 2 Arbitrage Profits**

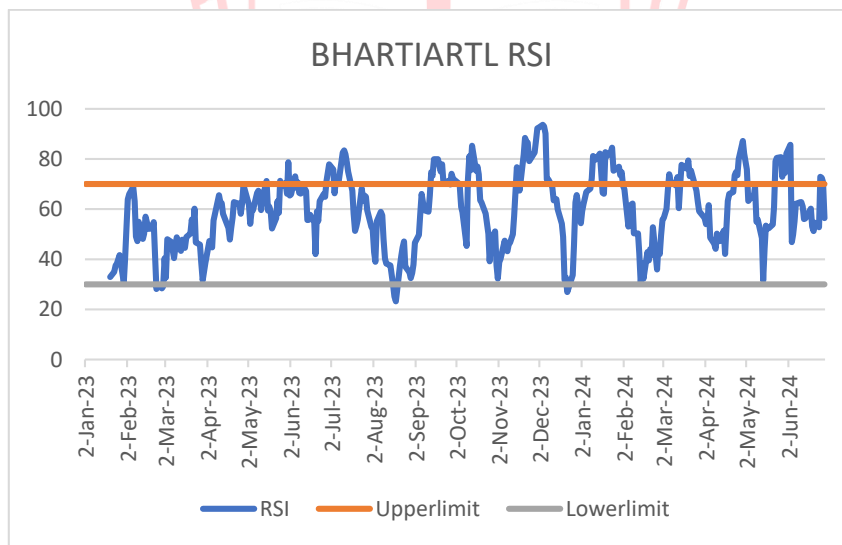
Company	Number of Contracts	Arbitrage Profits Per Contract (In ₹)			
		Mean	Maximum	Minimum	Standard Deviation
BHARTIARTL	Less than 50000	-2.76127	7.711097	-255.259	12.20869
	More than 50000	-3.19692	2.4191	-8.16685	5.3224
HDFCBANK	Less than 50000	-1.93158	12.74501	-20.8247	5.423398
	More than 50000	-5.29425	24.01285	-166.248	16.95497
ICICIBANK	Less than 50000	-1.22637	48.25169	-105.632	7.033967
	More than 50000	-2.05837	23.85169	-9.71029	5.967946
RELIANCE	Less than 50000	-3.41795	54.84396	-238.335	17.29855
	More than 50000	-6.03517	52.84396	-18.8663	9.700426
TCS	Less than 50000	-8.2905	137.522	-625.371	35.12001
	More than 50000	-19.3066	-11.3505	-27.2627	11.2516

Source: Computed secondary data

Based on the results of Table 3.2, it is clear that, the mean profits of all five companies are significant and less than zero which indicate the existence of mispricing between spot and futures market where, futures price is comparatively lower than spot price. An arbitrager can make super normal profits by way of entering into long position in futures market and selling the same in spot market. The profits more than zero were available for all companies, where, highest profits were available for RELIANCE and ICICI Bank. The profits less than zero were available for all companies, where highest negative values were available for BHARTIARTL and

RELIANCE. The risk inherent in such profits are visible through the high standard deviation. Higher the standard deviation, higher the risk involved. The standard deviation of profits was highest for TCS where maximum profits vary between ₹137.522 and ₹-11.3505. The lowest standard deviation was available for ICICIBANK. The overall result shows that, there are adequate mean profits available for arbitragers for their positions, if, suitable trading strategies are adopted. Further the trading opportunities were studied with the help of RSI and Bollinger bands. The graphs of RSI are provided from figure 1.1 to figure 1.5.

**Figure 1.1 RSI of BHARTIARTL**

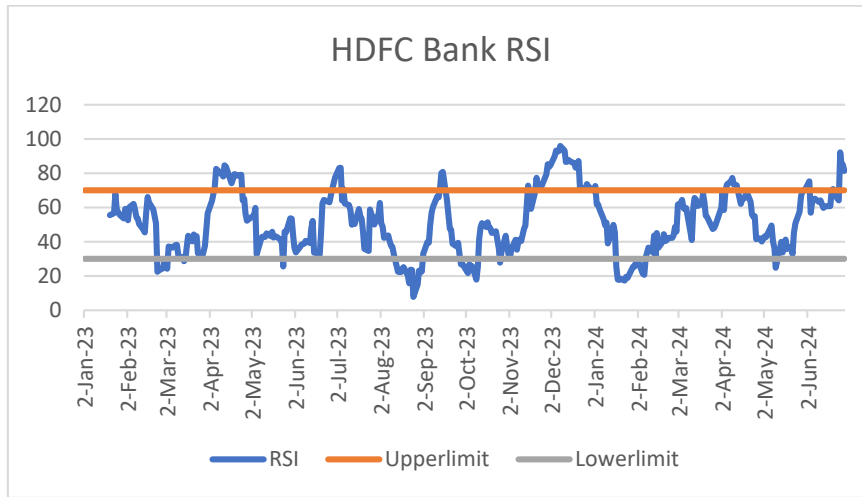


Source: Computed secondary data

From the figure 1.1, it is understood that there is more overbought condition than oversold position for the past year for BHARTIARTL company whereby arbitragers can make use of overbought positions which is indicated by the lines above 70 visibly more frequent in the past year.

The traders can make use of this condition by selling in an overbought market. Though in the beginning of the year the volatility was more or less stable but, was more volatile by June onwards. The result also shows comparatively less oversold position.

Figure 1.2 RSI of HDFC Bank

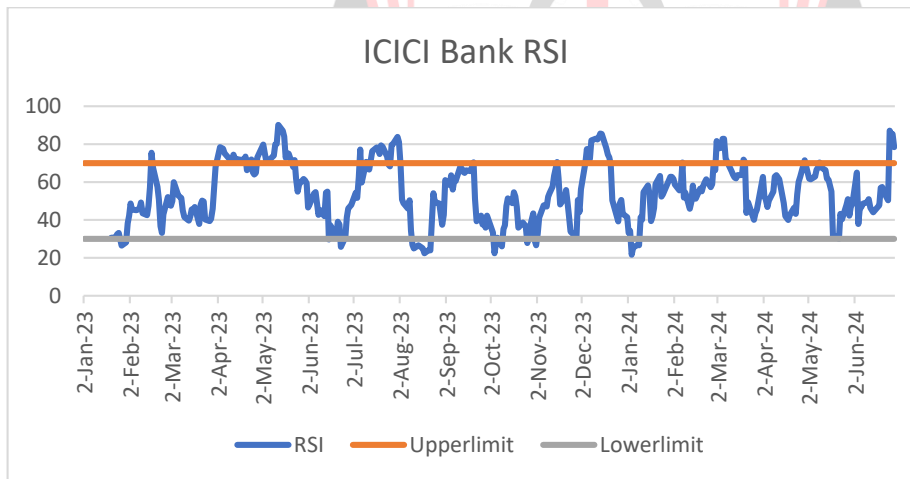


Source: Computed secondary data

In figure 1.2, it is understood that there are both overbought condition and oversold position for the past year for HDFC bank, whereby arbitragers can earn supernormal profits by going long and short in futures market in respect of overbought and oversold position. From the beginning of

the year itself the price showed volatile nature and it continued throughout the year, highest volatile nature was visible through December 2023. The result also showed equally overbought and oversold position through the time period.

Figure 1.3 RSI of ICICI Bank



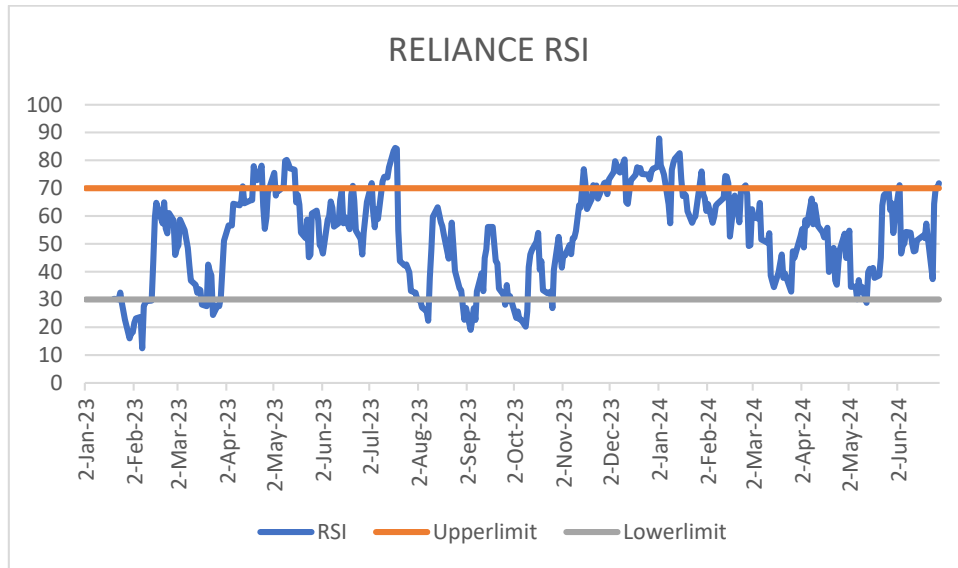
Source: Computed secondary data

From the figure 1.3, it is found that there is more overbought condition than oversold position for the past year for ICICI Bank whereby arbitragers can make use of overbought positions which is indicated by the lines above 70 visibly more frequent in the past year. The traders can

make use of this condition by selling in an overbought market.

From the beginning of the year itself the price showed volatile nature and it continued throughout the year. The result also shows comparatively less oversold position.

Figure 1.4 RSI of RELIANCE

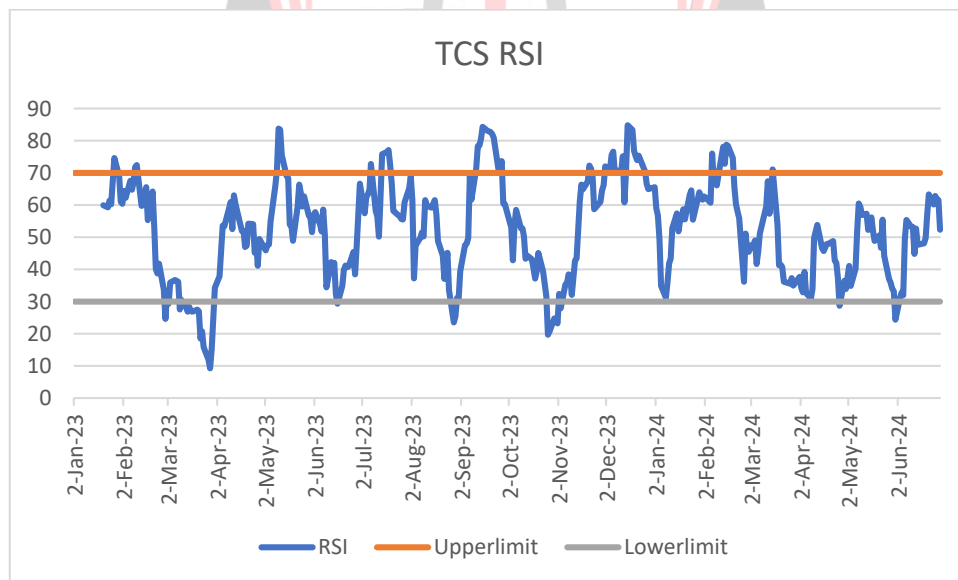


Source: Computed secondary data

For the company RELIANCE it is revealed that there are both overbought condition and oversold position for the past year from figure 1.4, whereby arbitragers can earn supernormal profits by going long and short in futures market in respect of overbought and oversold position.

From the beginning of the year itself the price showed volatile nature and it continued throughout the year and comparatively less oversold positions are visible, however the volatility in price seems more expressive in the RSI graph of RELIANCE.

Figure 1.5 RSI of TCS

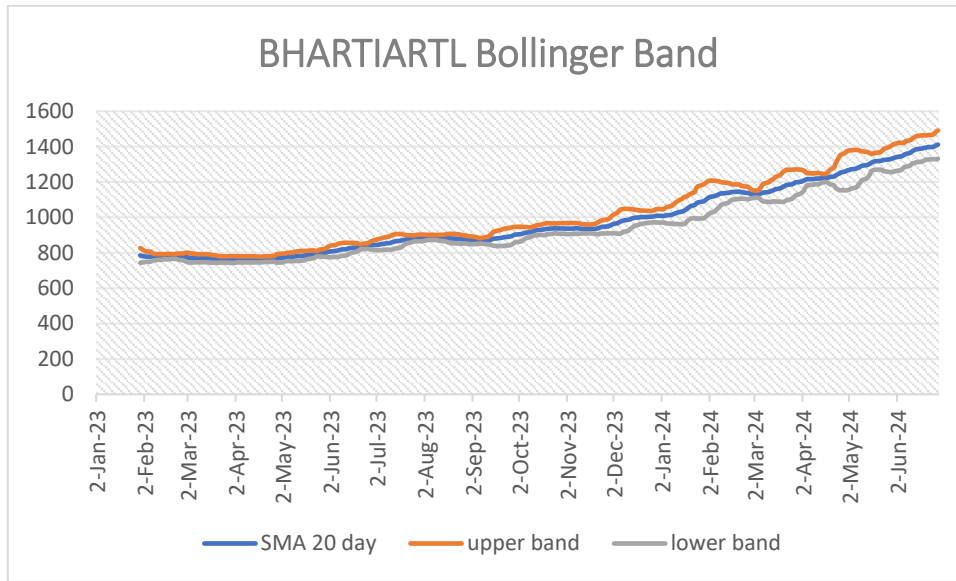


Source: Computed secondary data

In case of TCS, the figure 1.5, shows that there is more overbought condition than oversold position whereby Traders can earn from overbought positions which is indicated by the lines above 70 visibly more frequent in the past year.

From the figures given above, it is clear that, there are over bought and oversold position for all five companies whereby arbitragers can grab profits by buying in an oversold market and selling in an overbought market. The graphs of Bollinger bands are provided from figure 2.1 to figure 2.5.

**Figure 2.1 Bollinger bands of BHARTIARTL**

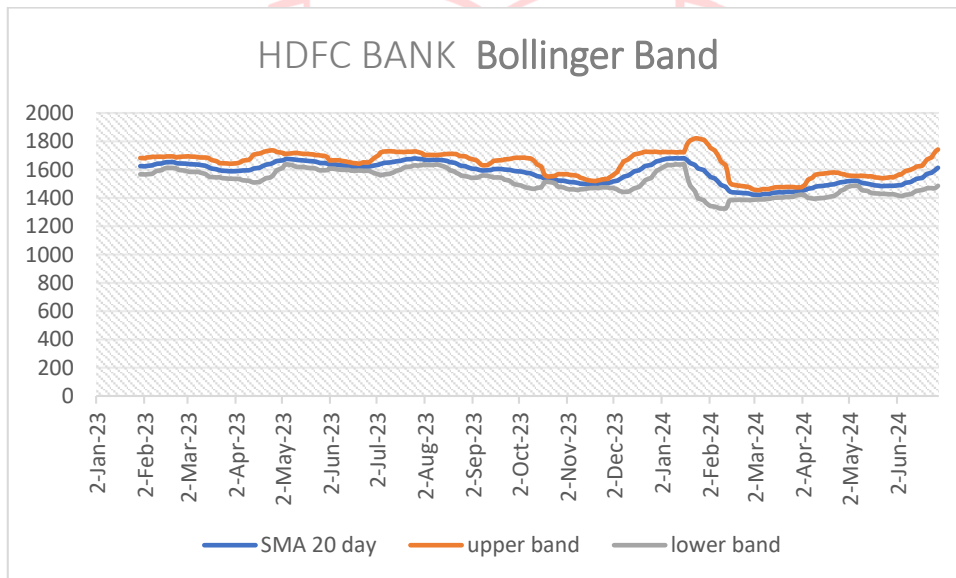


Source: Computed secondary data

From the figure 2.1, bullish trend is found for BHARTIARTL company whereby and the lines of Bollinger band indicates a lesser volatility in the beginning and higher volatility towards the end of June 2024. The upper band and lower band of BHARTIAIRTL was close in

the beginning indicating a squeeze but towards the end the volatile nature of stock is visible through the apart lines between 20 day simple moving average, upper band and lower band.

**Figure 2.2 Bollinger bands of HDFC Bank**



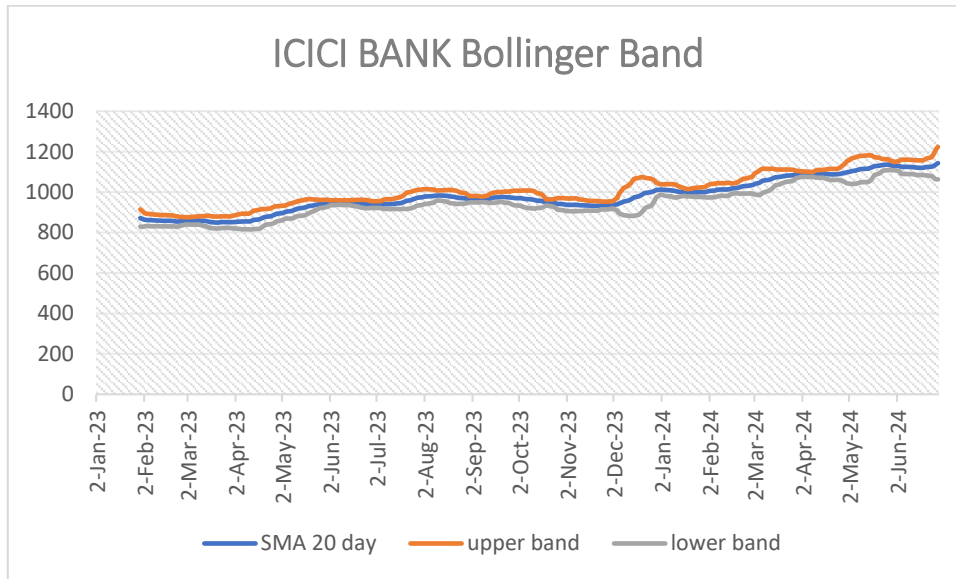
Source: Computed secondary data

In case of HDFC bank the lines of Bollinger band indicates a greater volatility towards the end of June 2024. Though the beginning show squeeze indicating trend reversal, the pattern goes on varying for HDFC bank. The upper band and lower band of HDFC BANK shows

interesting pattern towards the beginning of 2024 and the volatile nature of stock is visible through the apart lines between 20 day simple moving average, upper band and lower band.



**Figure 2.3 Bollinger bands of ICICI Bank**

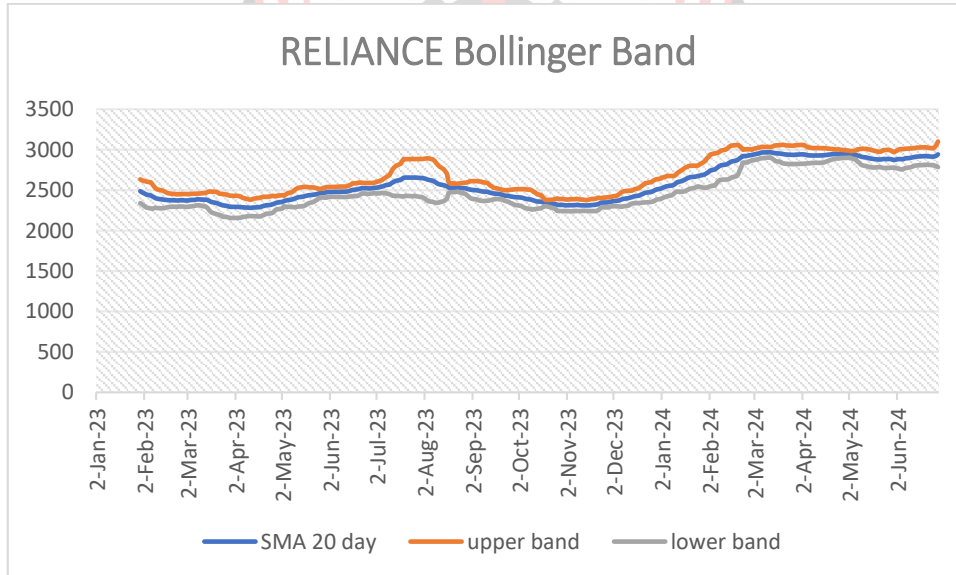


Source: Computed secondary data

For the company ICICI bank, figure 2.3 shows a bullish trend and the narrow lines of Bollinger band indicates a lesser volatility in the beginning and higher volatility towards the end of June 2024 and consistently implying the oversold and overbought position in futures market.

The upper band and lower band of ICICIBANK was close in the beginning indicating a squeeze but towards the end the volatile nature of stock is visible through December 2023 to January 2024 through the lines between 20 day simple moving average, upper band and lower band.

**Figure 2.4 Bollinger bands of RELIANCE**

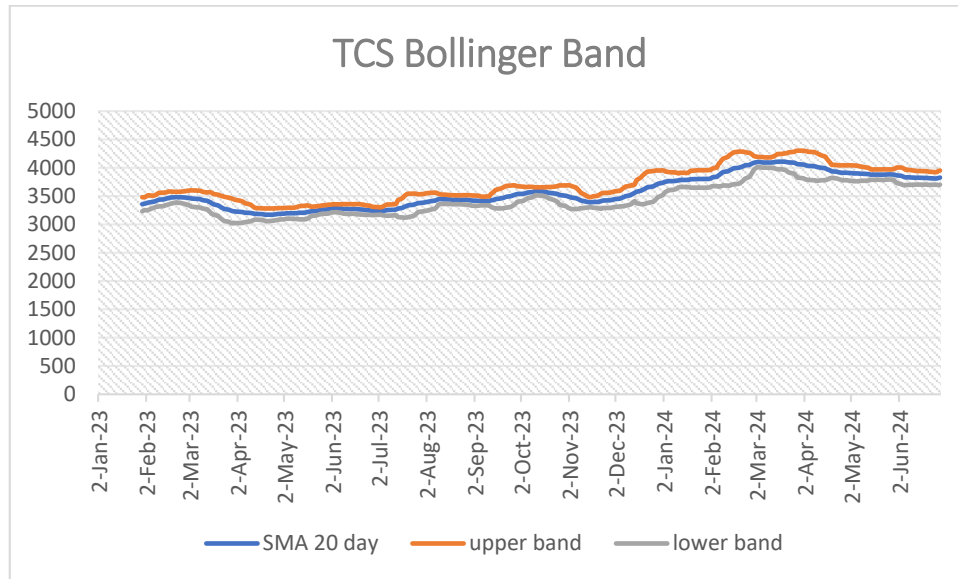


Source: Computed secondary data

From the figure 2.4, bullish trend is found for RELIANCE company where by the lines of Bollinger band indicates a volatile market in the beginning and lesser volatility towards the end of June 2024. The upper band and lower band of RELIANCE was close in the beginning

indicating a squeeze but towards the July to August 2023, the volatile nature of stock is visible through the apart lines between 20 day simple moving average, upper band and lower band.

Figure 2.4 Bollinger bands of TCS



Source: Computed secondary data

For the company TCS a bullish trend is found for the past year from figure 2.5 indicating a volatile market in the middle period and lesser volatility towards the end of June 2024. The upper band and lower band of TCS was close in

#### Findings

- The mean profits of all five companies are significant and less than zero which indicate the mispricing between spot and futures market.
- The profits more than zero were available for all companies, where highest profits were available for RELIANCE and ICICI Bank.
- The profits less than zero were available for all companies, where highest negative values were available for BHARATIARTL and RELIANCE.
- From RSI graphs, it is found that, there are over bought and oversold position for all five companies whereby arbitragers can grab profits by buying in an oversold market and selling in an overbought market.
- From Bollinger bands a bullish trend is found for all companies and volatile market conditions were revealed in various dates.

#### IV. SUGGESTIONS

- Based on the results, Indian equity futures market found to be appropriate for arbitrage, by applying adequate trading strategies.

the beginning, but towards the end of December 2023, the volatile nature of stock is visible from the lines between 20-day simple moving average, upper band and lower band.

- Traders can make use of overbought and oversold position for all five companies and earn profits by buying in an oversold market and selling in an overbought market.
- The results of spot parity theorem reaffirm the arbitrage opportunities as stated by [3].

#### V. CONCLUSION

Arbitrage in the Indian futures market is an essential strategy that helps in maintaining price efficiency and reducing market distortions. While opportunities for risk-free profits are typically short-lived due to market forces and competition, regulatory frameworks, liquidity variations, and macroeconomic factors can occasionally create such opportunities. From the results of spot parity theorem it can be concluded that there are adequate arbitrage opportunities for traders of the five companies. With the growth of derivatives trading and increased market participation, Indian futures markets have become more efficient, but arbitrage still plays a vital role in the market dynamics. The findings of the study can be of made use for traders, policy makers and academicians.

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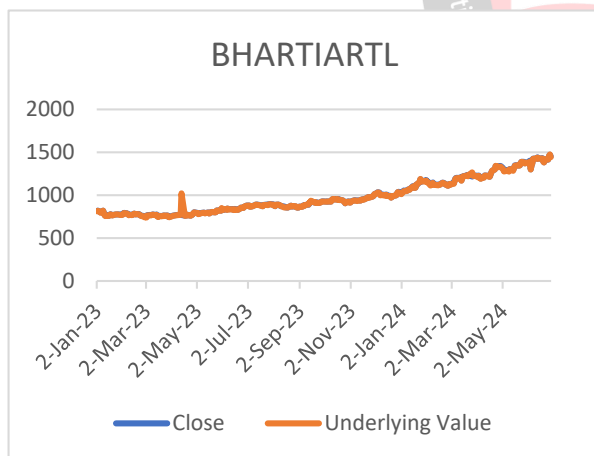
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**Appendices:**

**Graphs of Futures price and spot price of companies**

**Figure 3.1**

**Line Graph of BHARTIARTL**



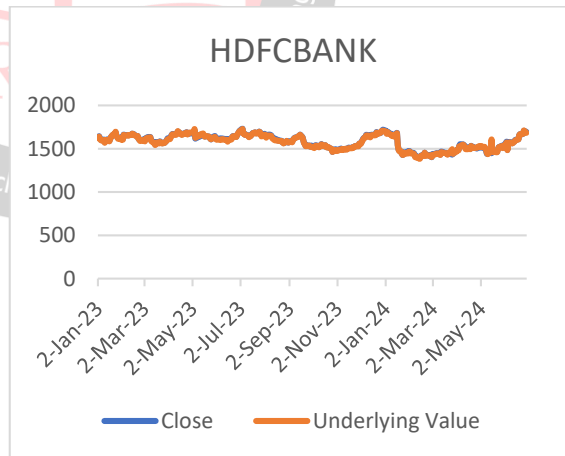
Source: Computed secondary data

**Figure 3.3**

**Line Graph of ICICIBANK**

**Figure 3.2**

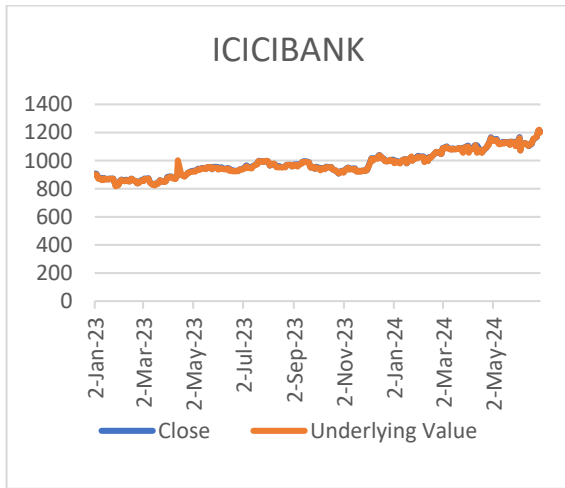
**Line Graph of HDFCBANK**



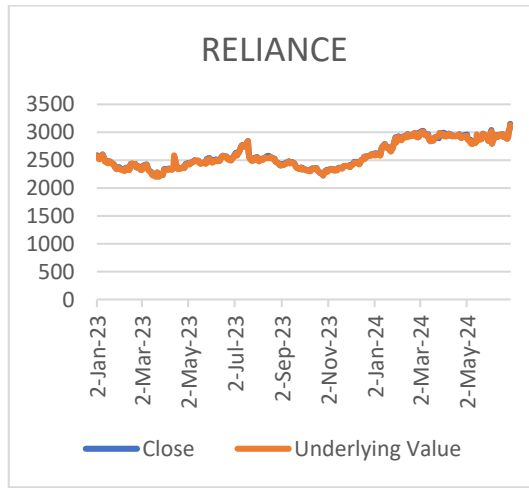
Source: Computed secondary data

**Figure 3.4**

**Line Graph of RELIANCE**



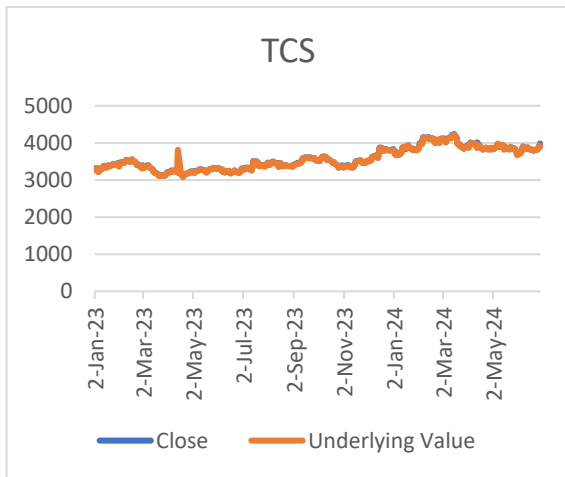
Source: Computed secondary data



Source: Computed secondary data

Figure 3.5

Line Graph of TCS



Source: Computed secondary data

