



NSE SILVER
DERIVATIVES
Performance Review
2023-24

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Performance Review of Commodity Derivatives - FY 2023-24

Silver Futures, Silver Options (On Goods), Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures

1. Background

a. Brief about the commodity such as sample picture, lifecycle and various varieties/grade of the commodity found in India.

Silver (Ag) has been used for thousands of years for ornaments and utensils, trade, and as the basis for many monetary systems. Its value as a precious metal is considered second only to gold. Silver is a brilliant grey-white metal that is soft and malleable. Its unique properties include its strength, malleability, ductility, electrical and thermal conductivity, sensitivity, high reflectance of light, and reactivity. The main source of silver is lead ore, although it can also be found associated with copper, zinc and gold and produced as a by-product of base metal mining activities. Secondary silver sources include coin melt, scrap recovery, and dis-hoarding from countries where export is restricted. India imports Silver (unwrought or semi-manufactured) from countries such as China, the United Kingdom, the Russian Federation, Germany, and Rep of Korea, while it exports silver jewellery to countries such as US, Hong Kong, and UAE. For silver, India is a very special place as no other country has tried to explore the versatility of silver for day-to-day use as much as India.

b. Commodity fundamentals and balance sheet as per the following format (to be prepared based on publicly available information on best effort basis):

Table – Fundamentals & Balance Sheet

Global Silver supply (Million Ounces)

Supply	2022	2023
Mine Production	836.7	830.5
Recycling	176.9	178.6
Net Hedging Supply	-	-
Net Official Sector Sales	1.7	1.6
Total Supply	1015.4	1010.7

Source: Metals Focus & World Silver Survey 2024

Global Silver Demand (Million Ounces)

Demand	2022	2023
Industrial	588.3	654.4
Photography	27.5	27.0
Jewelry	234.5	203.1

Silverware	73.5	55.2
Net Physical Investment	337.1	243.1
Net Hedging Demand	17.9	12.2
Total Demand	1278.90	1195.0

Source: Metals Focus & World Silver Survey 2024

India Silver supply and demand (Million Ounces)

Particulars	2022	2023
Supply		
Net Bullion Import	303.8	111.7
Mine Production	22.3	23.8
Recycling	15.4	17.0
Physical Investment	79.4	49.3
Demand		
Jewellery Fabrication	111.6	83.7
Silverware Fabrication	53.6	37.5
Coins & Medal Fabrication	16.9	11.8
Industrial Demand	42.6	41.4
Electrical and Electronics Demand	17.2	18.2
Brazing Alloys and Solder Demand	3.0	3.1

Source: Metals Focus & World Silver Survey 2024

Major producing countries (Million Ounces): Silver mine production

Mine Production	2022	2023
Mexico	213.2	202.2
China	111.8	109.3
Peru	107.0	107.1
Chile	41.9	52.0
Bolivia	38.8	42.6
Poland	42.4	42.5
Russia	41.1	39.8
Australia	37.5	34.4

United States	33.2	32.0
Argentina	30.8	26.0

Source: Metals Focus & World Silver Survey 2024

Major consuming countries (Million Ounces): Silver Industrial Demand

Industrial Demand	2022	2023
China	181.4	261.2
United States	127.0	128.1
Japan	98.3	98.0
India	42.6	41.4
Germany	30.9	31.2
United Kingdom	23.2	9.5
South Korea	20.2	19.5
France	10.3	10.9
Taiwan	9.9	9.4
Italy	9.6	9.6

Source: Metals Focus & World Silver Survey 2024

Major exporting countries (In Billion \$)

Country	2022	2023
United Kingdom	8.2	NA
Hong Kong	3.5	NA
China	2.8	NA
Mexico	2.3	NA
Germany	1.8	NA
United States	1.8	NA
South Korea	1.6	NA
Switzerland	1.6	NA
Japan	1.6	NA
Canada	0.94	NA

Source: Worldstopexports.com, NA: Data for 2023 is not available in the public domain

Major importing countries (In Billion \$)

Country	2022	2023
United States	5.81	NA
Canada	3.77	NA
Hong Kong	2.95	NA
United Kingdom	2.33	NA
Turkey	1.95	NA
Switzerland	1.84	NA
Germany	1.82	NA
India	1.32	NA
Japan	1.24	NA
China	1.10	NA

Source: OEC World, NA: Data for 2023 is not available in the public domain

Top producing states in India

State	Silver Production (in Tonnes)	% of India's Total Production
Rajasthan	43	56.6%
Andhra Pradesh	9.2-11.5	12-15%
Telangana	5-6	6-7.5%
Haryana	4-5	5-6.5%
Jharkhand	3-4	4-5%
Karnataka	2-3	2.5-4%
Madhya Pradesh	2-3	2.5-4%
Gujarat	1-2	1-2.5%

Source: textbook.com

c. Major changes in the policies governing trade in the spot markets of the commodity

India's silver trade underwent significant policy changes, influenced by the Reserve Bank of India (RBI). The RBI's Monetary Policy Report of April 2024 indicates a strategic shift in the financial ecosystem, affecting commodities including silver. This is corroborated by the RBI Bulletin from April 2024, which provides insights into the monetary and regulatory policies that have likely impacted the silver trade. The decline in value shipments of the Indian silver market in 2022 set the stage for a policy-driven recovery and growth. The report also projected a significant Compound Annual Growth Rate (CAGR) of 22% from 2023 to 2029, suggesting a strong rebound and growth potential for the silver market in India, driven by domestic investment and export opportunities.

The Foreign Trade Policy (FTP) of 2023 has been pivotal in shaping the trade dynamics. Announced with the vision to elevate India's exports to \$2 trillion by 2030, the policy underscores the government's commitment to enhancing the export infrastructure and capabilities across various sectors, including the silver market. The FTP emphasizes the importance of reducing import dependency and fostering export-oriented growth, which aligns with the observed policy changes in the silver trade. The DGFT notice listing banks authorized to import gold and silver for the fiscal year 2023-24 reflects the regulatory environment designed to streamline and oversee the import process, which directly affects the silver trade market. Additionally, the Index to RBI Circulars provides further evidence of the regulatory framework that governs the financial operations and, by extension, the trade of precious commodities like silver.

d. Geopolitical issues in the commodity and its impact on Indian scenario

The geopolitical events of 2023, particularly the banking crisis and regional conflicts, had a significant impact on the Indian silver market. The instability in the banking sector led to a heightened demand for silver as a safe-haven asset, which saw India's silver imports surge in the early months of 2024. However, this was set against a backdrop of declining jewellery demand after a record high in 2022, indicating a market correction. The industrial demand for silver in India, especially for photovoltaics, remained robust, reflecting a global trend where industrial applications, particularly in renewable energy and electronics, support the market.

Despite these positive indicators, the Indian silver market faced challenges. This suggests that while the demand for silver in industrial applications was on the rise, other sectors like jewellery and investment might not have kept pace. Additionally, the Indian market showed a trend towards reducing imports and shifting towards local production to meet its growing demand, which could be attributed to the government's initiatives to boost domestic production and reduce dependency on imports.

The geopolitical issues that influenced the silver market globally also had a direct impact on India's trade and investment strategies. The demand for silver in India reflected the market's sensitivity to global political and economic developments, with a notable shift towards safe-haven assets amidst uncertainty. These events underscore the interconnectedness of geopolitics and financial markets, and their collective impact on commodities like silver. The insights from this period are invaluable for understanding the complexities of the Indian silver market and for anticipating future trends in the face of geopolitical uncertainties.

2. Trading related parameter

NSE had the following Gold derivatives available for trading on its Commodity Derivatives Segment in FY 2023-24.

- Silver Futures
- Silver Options (on Goods)
- Silver Mini Futures
- Silver Mini Options on Futures
- Silver Micro Futures

a. Monthly and Annual traded volume (quantity in appropriate units)

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Month	30 Kgs	30 Kgs
	Silver Futures	Silver Options on Goods
April 2023	NIL	NIL
May 2023	NIL	NIL
June 2023	NIL	NIL
July 2023	NIL	NIL
Aug 2023	NIL	NIL
Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	3	NIL
Dec 2023	9	2696
Jan 2024	4	2404
Feb 2024	6	4826
Mar 2024	4	4567
FY 2023-24	26	14493

b. Annual traded volume as proportion of total deliverable supply (quantity in appropriate units)

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Contract	Annual Traded Volume (MT)	Deliverable Supply (MT)	Annual traded volume as proportion of total deliverable supply (%)
Silver Futures	0.78	5721	0.014
Silver Options on Goods	434.79	5721	7.600

c. Annual traded volume as proportion of total annual production (quantity in appropriate units)

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Contract	Annual Traded Volume (MT)	Annual Production (MT)	Annual traded volume as proportion of total annual Production (%)
Silver Futures	0.78	675	0.116
Silver Options on Goods	434.79	675	64.413

d. Annual average Open interest as proportion of total production

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Contract	Annual Average OI (MT)	Annual Production (MT)	Annual traded volume as proportion of total annual Production (%)
Silver Futures	0.004	675	0.001
Silver Options on Goods	0.0582	675	0.009

e. Annual average Open interest as proportion of total deliverable supply

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Contract	Annual Average OI (MT)	Deliverable Supply (MT)	Annual traded volume as proportion of total deliverable supply (%)
Silver Futures	0.004	5721	0.000
Silver Options on Goods	0.0582	5721	0.009

f. Monthly and Annual value of trade (in Rs. Crores)

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Month	Rs Crores	Rs Crores
	Silver Futures	Silver Options on Goods
April 2023	NIL	NIL
May 2023	NIL	NIL
June 2023	NIL	NIL
July 2023	NIL	NIL
Aug 2023	NIL	NIL
Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	0.69	NIL
Dec 2023	2.02	614.26
Jan 2024	0.86	517.7
Feb 2024	1.28	1060.56
Mar 2024	0.89	1033.21
FY 2023-24	5.74	3225.73

g. Monthly and Annual quantity of delivery (in appropriate units)

There were no deliveries in any of the Silver contracts in FY 23-24.

h. Monthly and Annual value of delivery (in Rs. Crores)

There were no deliveries in any of the Silver contracts in FY 23-24.

i. Monthly and Annual Average Open Interest (OI) (in appropriate units)

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Month	30 Kgs	30 Kgs
	Silver Futures	Silver Options on Goods
April 2023	NIL	NIL
May 2023	NIL	NIL
June 2023	NIL	NIL
July 2023	NIL	NIL
Aug 2023	NIL	NIL
Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	0.13	NIL
Dec 2023	0.60	0.20
Jan 2024	0.42	0.23
Feb 2024	0.57	5.42
Mar 2024	0.20	18.55
FY 2023-24	0.16	1.94

j. Annual average volume to open interest ratio

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Contract	Unit	Annual Average Traded Volume	Annual Average Open Interest	Annual average OI as a proportion of Annual average volume (%)
Silver Futures	30 Kgs	26	0.16	0.61
Silver Options on Goods	30 Kgs	14,493	1.94	0.01

k. Total number of unique members and clients who have traded during the financial year

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

Contract	Unique Member Count	Unique Client Count
Silver Futures	3	3
Silver Options on Goods	20	27

l. Ratio of open interest by FPOs/farmers/Hedge/VCP positions to total open interest (Annual average as well as maximum daily value)

The traded volume by FPOs/farmers/Hedge/VCP for Silver derivatives in FY 23-24 was NIL/Negligible.

m. Number of unique FPOs / farmers and VCPs/hedgers who traded in the financial year.

The traded volume by FPOs/farmers/Hedge/VCP for Silver derivatives in FY 23-24 was NIL/Negligible.

n. Algorithmic trading as percentage of total trading

The traded volume for Silver Mini Futures, Silver Mini Options on Futures & Silver Micro Futures in FY 23-24 was NIL/Negligible.

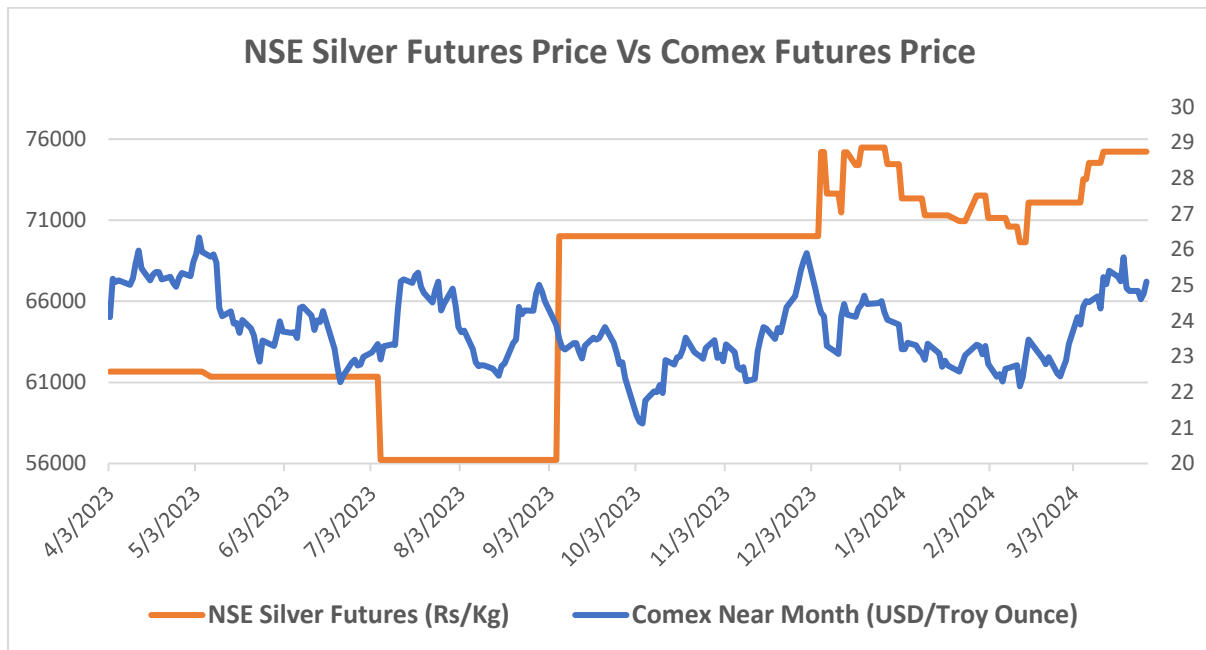
Contract	Algorithmic trading as percentage of total trading (%)
Silver Futures	50.00
Silver Options on Goods	51.17

- o. Delivery defaults**
 - i. Number of instances**
 - ii. Quantity involved**
 - iii. Value involved**

There were no delivery defaults in any of the Silver contracts in FY 23-24.

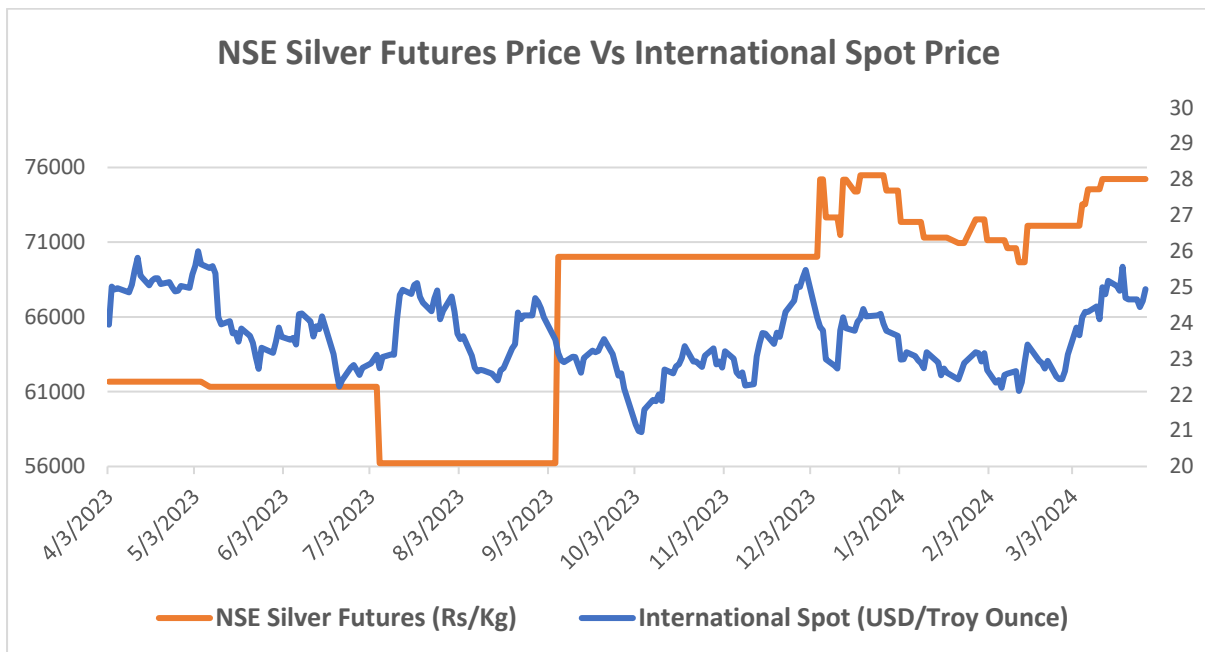
3. Price movements

- a. Comparison, correlation and ratio of standard deviation of Exchange futures price vis-à-vis international futures price (wherever relevant comparable are available)**



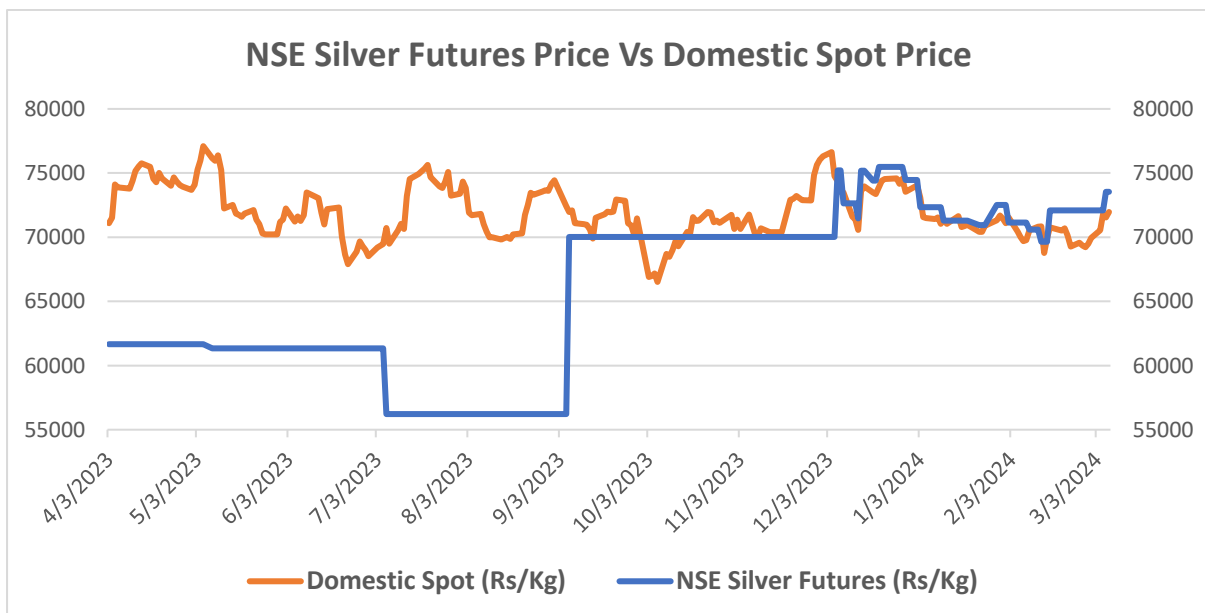
Correlation: -20% | Ratio of Std Deviation: 1.17

b. Comparison, correlation and ratio of standard deviation of Exchange futures price vis-à-vis international spot price (wherever relevant comparable are available) and domestic spot price (exchange polled price).



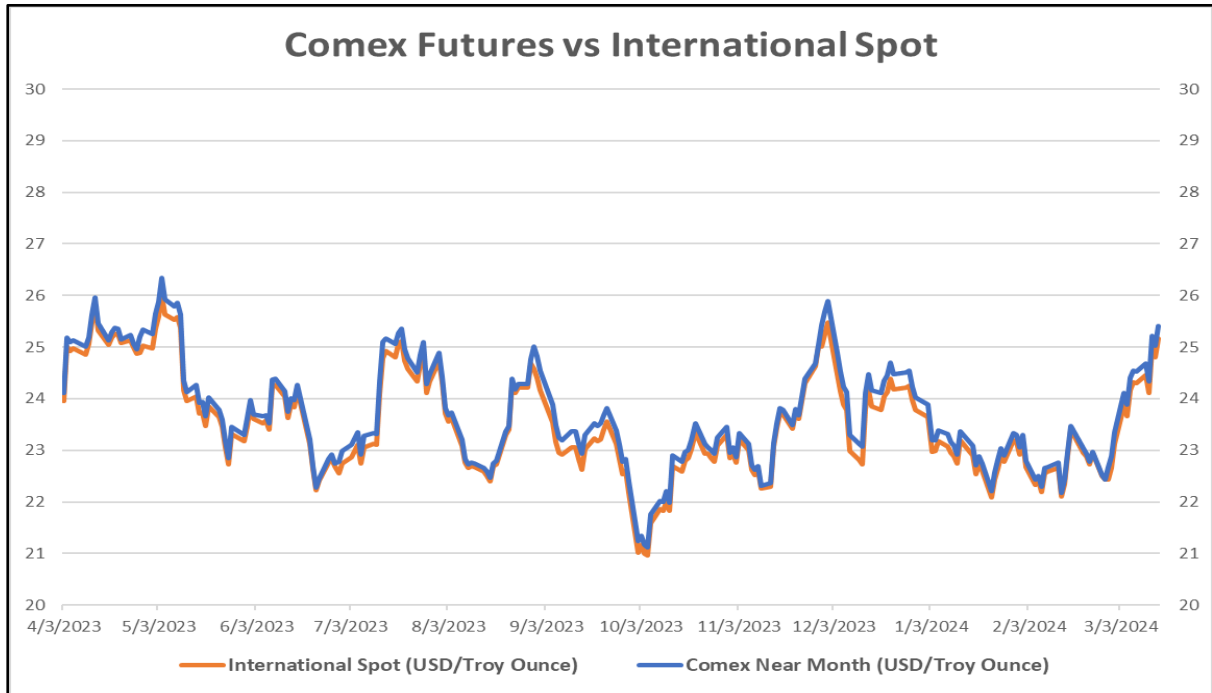
Correlation: -23% | Ratio of Std Deviation: 1.19

c. Correlation between exchange futures & domestic spot prices along with ratio of standard deviation.



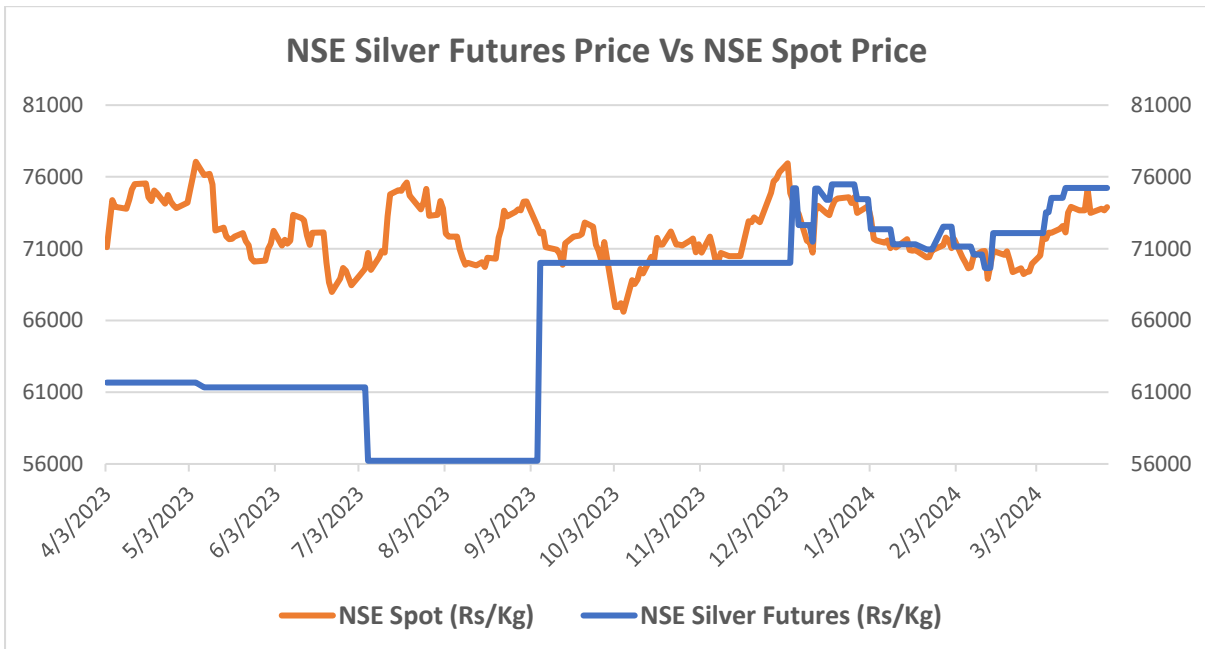
Correlation: -13% | Ratio of Std Deviation: 0.30

d. Correlation between international futures & international spot prices along with ratio of standard deviation (wherever relevant comparable are available).



Correlation: 100% | Ratio of standard deviation: 0.97

e. Comparison of Exchange polled price and mandi price (in case of agricultural commodities) / other relevant price (in case non-agricultural commodities) at basis centre.



Correlation: -13% | Ratio of Std Deviation: 0.30

f. Maximum & Minimum value of daily futures price volatility and spot price volatility along with disclosure of methodology adopted for computing the volatility.

Contract	Max Volatility in Futures Prices (%)	Min Volatility in Futures Prices (%)	Max Volatility in Spot Prices (%)	Min Volatility in Spot Prices (%)
Silver Futures	NA	NA	6.33	0.01

Volatility calculation: (Day – Previous day’s price)/Previous day’s price

NA – Could not be appropriately determined due to scattered trades in Futures contracts

g. Number of times the futures contract was in backwardation/contango by more than 4% for the near month contract in the period under review.

No instance has been observed where the backwardation or contango exceed 4% for the near month contract.

Sources for this section: Tradingview and NSE

4. Other parameters

a. Qualitative and quantitative measure for Hedge effectiveness ratio and basis Risk (Volatility of Basis) along with disclosure of methodology adopted for such calculations.

Date	Price		Price Change		Hedge Effectiveness
	NSE SILVER Spot Price	NSE SILVER Futures	NSE SILVER Spot Price	NSE SILVER Futures	
9/6/2023	72053	70018	-524	13798	103.80
12/6/2023	74320	75200	-561	5182	110.83
12/8/2023	73438	72650	-13	-2550	99.49
12/20/2023	73895	75480	550	1080	49.07
1/11/2024	71338	71300	307	-1050	129.24
2/2/2024	71668	71145	624	-1380	145.22

3/6/2024	71687	73530	-210	1435	114.63
			Overall Average		107.47

The Dollar Offset Method of determining Hedge Effectiveness is one of the quantitative methods used extensively. It involves comparing the ratio of the change in fair value or present value of future expected cash flows of the hedging instrument (NSE Futures) with the change in the fair value or present value of future cash flows of the hedged item (Spot Price) attributable to the hedged risk.

Methodology

To examine the hedge effectiveness twelve random dates were chosen with minimum gap between the period as 15 days and maximum being 3 months period (matching various operating cycles of the bullion value chain participants). For each of these chosen dates, Spot Price and Futures closing rates were recorded. The change in value of Spot rates as well as Futures closing rates for two consecutive periods was recorded. Hedge effectiveness is the ratio of change in the value of Spot prices to the change in Futures value.

Values between 80% to 125% indicate the hedge effectiveness is good. Values below 80% indicate that the hedge effective is not good. Based on the observations, it can be noticed that overall hedge effectiveness is over 107.47%.

Longer period hedge tends to be less effective. It could be due to roll-over and related contango issues or liquidity issues. Second aspect is when there is a disruptive change in the underlying market, hedge effectiveness declines.

Basis risk:

Basis is the difference between the spot price and the futures price at a particular point in time. Basis is usually very small and tends to decrease as futures contract moves towards expiry.

The basis risk arises due to price, location, product or timing difference. When it comes to prices, after the GST introduction, location-based premiums and discounts have been more or less resolved. However, the most important source of basis risk is price. Seasonality in demand, high customs duty and consequently, high parallel trade result in markets going into discounts more often in the last few years breaking the parity. This could result in non-convergence of futures price and spot price upon delivery.

b. Details about major physical markets of the commodity vis-à-vis market reach in terms of availability of delivery centers (information to be provided state-wise and UT-wise).

The major import and physical trade areas for Silver and NSE's market reach in terms of availability of delivery centers is provided below:

Sr. No.	Major cities based on Silver import and consumption	NSE's delivery centre
1	Chennai	Additional Delivery Center
2	Kandla	No
3	Delhi	Additional Delivery Center
4	Ahmedabad	Primary Delivery Center
5	Mumbai	Additional Delivery Center

c. Details about major physical markets of the commodity and average Open Interest for each month generated from those regions.

Major physical markets data provided in the point 4b. The region wise OI data is not available.

d. Details, such as number and target audience, of stakeholders' awareness programs carried out by the exchange.

For education initiatives, the exchange has conducted 411 awareness campaigns across INDIA covering all the commodities available on the NSE platform. These programs were attended by more than 15,000 stakeholders.

e. Steps taken / to be undertaken to improve hedging effectiveness of the contracts as well as to improve the performance of illiquid contracts.

NSE is constantly striving to encourage hedgers to participate in the Gold contracts. We have value chain participants and associations such as IBJA, All India Gem & Jewellery Domestic Council, WGC, Metals Focus, etc. as part of our Bullion PAC, who guide us on how to get more participation from physical market participants.

5. Any other information to be disclosed as deemed important by the exchange or as suggested by the PAC.