



NSE GOLD
DERIVATIVES
Performance Review
2023-24

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Performance Review of Commodity Derivatives - FY 2023-24

Gold Futures, Gold Options on Futures, Gold Mini Futures, Gold Mini Options on Futures, Gold 1G Futures, Gold Guinea Futures & Gold Mini Options on Goods

1. Background

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

Gold is the oldest precious metal known to man and for thousands of years it has been valued as a global currency, a commodity, an investment and simply an object of beauty. Due to its chemical and physical properties it finds application in a variety of uses. Gold is relatively easy to accumulate, transact and sell. Also, it is one of the assets widely held by women in India. In the Indian context, gold ownership provides an indirect exposure to the US dollar, as India imports almost all of its gold from the international market priced in US dollars. Gold is a classic hedge tool against inflation or other economic disruptions. Many owners of gold store it in the form of bullion bars or coins specifically for this purpose. However, the recent financial crisis has convinced some economists not to believe gold serves as a secure hedge tool. Bullion coins of today's age are typically minted with fine gold at 24k. The South African Krugerrand, the American Gold Eagle and the British Gold Sovereign are still minted in 22k metal in a historical tradition. The Canadian Gold Maple Leaf is the coin with the highest purity gold of any bullion coin at 99,999%. Gold in contrast to other commodities is not affected by consumption. Nearly all the gold mined in the world is still accessible today. Therefore, the demand has a far greater impact on the price than the supply. The global economy is a strong indicator for future gold prices. In times of international financial crisis, investors tend to purchase gold, which has proven to thrive during economic crises and provides more security for investors.

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

World Balance Sheet

Gold World Balance Sheet (In metric tons)

Global Scenario	2022	2023
SUPPLY		
Mine Production	3,632.4	3,636.2
Recycling	1,140.1	1,238.9
Net Hedging	-13.1	55.3
Total Supply	4,759.5	4,930.4
DEMAND		
Jewellery Fabrication	2,195.9	2,192.2

Total Bar & Coin	1,222.1	1,185.4
ETFs & Others	-109.2	-244.7
Central Banks & others	1,081.9	1,037.1
Total Demand	4,759.5	4,930.4

Source: Metals Focus, Refinitiv GFMS, ICE Benchmark Administration, World Gold Council

India balance sheet (in metric tons)

India Scenario	2022	2023
SUPPLY		
Net Bullion Imports	650.7	724.1
Scrap	97.6	117.1
Other Sources	11.8	16.1
Total Supply	760.1	857.3
DEMAND		
Jewellery Fabrication/Consumption	600.6	575.8
Bar & Coin/Physical Investment	173.6	185.2
Total Demand	774.2	761.0

Source: World Gold Council & Metals Focus

Top 10 Major producing countries (in metric tons)

Country	2022	2023
China	375.0	420
Australia	313.9	330
Russia	324.7	310
USA	172.7	200
Canada	194.5	180
Indonesia	124.9	160
Peru	125.7	130
Ghana	127.0	130
Mexico	124.0	110

South Africa	92.6	101
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Source: Metals Focus & World Gold Council (2022) & CEO World Magazine (2023)

Top 10 major gold-consuming (Consumer Demand) countries (in metric tons)

Country	2022	2023
Greater China	824.9	959.1
India	774.1	761.0
United States	252.4	249.7
Turkey	121.7	192.2
Iran	71.7	71.8
Russian Federation	60.7	71.2
Germany	196.5	57.5
Egypt	51.5	57.0
Vietnam	59.1	55.5
Saudi Arabia	50.1	52.3

Source: World Gold Council & Metals Focus

Top 10 Major Gold exporting countries (in US \$ billion)

Country	2022	2023
Switzerland	100.3	NA
United Kingdom	73.0	NA
United States	37.2	NA
Hong Kong	30.2	NA
United Arab Emirates	24.1	NA
Australia	16.4	NA
Singapore	15.5	NA
Canada	15.0	NA
Japan	10.9	NA
Peru	7.4	NA

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

Top 10 Major gold importing countries (in US \$ billion)

Country	2022	2023
Switzerland	98.5	NA
China	76.7	NA
United Kingdom	42.0	NA
Hong Kong	38.0	NA
India	36.6	NA
Türkiye	20.4	NA
Singapore	17.7	NA
United Arab Emirates	15.5	NA
Thailand	11.4	NA
Germany	10.6	NA

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

Top producing states

India's gold production is very negligible at less than 2 tons per year. At present, it is coming from Karnataka. Karnataka produces 80% of the gold in India. By States, the largest resources in terms of gold ore (primary) are located in Bihar (44%) followed by Rajasthan (25%), Karnataka (21%), West Bengal (3%), Andhra Pradesh (3%), Jharkhand (2%). The remaining 2% resources of ore are located in Chhattisgarh, Madhya Pradesh, Kerala, Maharashtra and Tamil Nadu.

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

Between April 2023 and March 2024, India experienced significant policy changes in the gold trade, including the implementation of a Comprehensive Economic Partnership Agreement (CEPA) with the UAE, which extended a 1% custom duty concession for up to 200 tons of bullion imported from the UAE. The customs duty on gold fundings was raised from 10% to 15% in January 2024 to eliminate duty arbitrage, which had led to a surge in gold fundings imports. The Indian government's borrowing plans exceeded traders' expectations, and the 10-year government bond yield rose to a 33-month high. The Reserve Bank of India increased its total gold reserves to 760.4 tons by March 2024, indicating a strategic approach to bolstering national reserves amid global economic shifts. These policy changes influenced gold prices and demand, with the domestic gold price ending 1.7% higher in March at Rs 51,317/10g. Retail demand remained sluggish, leading to a widened local market discount to US\$60/oz. However, market sentiment improved at the beginning of April, driven by festival- and wedding-related purchases and consumer acceptance of higher gold prices. The domestic price discount narrowed to US\$12/oz by the second week of April, suggesting a recovery in demand. These developments highlight the dynamic nature of the gold trade in India and the impact of policy decisions on financial markets. Investors and traders must stay informed about these changes to navigate the market effectively.

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

The gold market in India has been significantly impacted by geopolitical issues, particularly the Israeli-Palestinian conflict. This has led to an increase in gold prices as investors seek safe-haven assets during uncertain times. The ongoing conflicts and trade tensions, along with over 60 global elections, have contributed to a volatile environment, further bolstering gold's appeal as a secure investment. In India, the unprecedented rise in international and domestic gold prices, trading above \$2,300/oz, has suppressed consumer demand, particularly in the jewellery sector, which constitutes a significant portion of India's gold consumption. However, this surge in prices has stimulated investment demand for gold bars and coins, as investors look to hedge against economic uncertainty and inflationary pressures.

The Reserve Bank of India has responded to these market dynamics by continuing to build its gold reserves, adding 18.5 tonnes since the start of 2024, taking the reserves to an all-time high. The domestic gold market has also seen a narrowing of the discount on gold prices relative to international rates, suggesting a potential alignment with global pricing trends.

Looking ahead, the Indian gold market faces challenges such as elevated prices, fewer weddings, and election-related restrictions, which are likely to impact consumer demand. However, any price stability ahead of the Akshaya Tritiya festival could provide some respite and potentially boost consumer sentiment. The investment demand for gold is expected to remain robust, given gold's strong performance and historical role as a hedge against economic and geopolitical risks.

2. Trading related parameter

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

- Gold Futures
- Gold Options on Futures
- Gold Mini Futures
- Gold Mini Options on Futures
- Gold 1G Futures
- Gold Guinea Futures
- Gold Mini Options on Goods (Discontinued on October 13, 2023 – Last trading day)

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

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Month	100 Grams	100 Grams
	Gold Mini Futures	Gold Mini Options on Goods
April 2023	20	25,630
May 2023	26	18,766
June 2023	24	3,555
July 2023	1	24
Aug 2023	NIL	NIL

Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	NIL	NA
Dec 2023	NIL	NA
Jan 2024	NIL	NA
Feb 2024	NIL	NA
Mar 2024	NIL	NA
FY 2023-24	71	47,975

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

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Annual Traded Volume (MT)	Deliverable Supply (MT)	Annual traded volume as proportion of total deliverable supply (%)
Gold Mini Futures	0.0071	857.3	0.001
Gold Mini Options on Goods	4.79	857.3	0.559

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

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Annual Traded Volume (MT)	Annual Production (MT)	Annual traded volume as proportion of annual production (%)
Gold Mini Futures	0.0071	133.2	0.005
Gold Mini Options on Goods	4.79	133.2	3.596

Production: Scrap + Other Sources is considered

d. Annual average Open interest as proportion of total production

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Annual average OI (MT)	Production (MT)	Annual average OI as proportion of Production (%)
Gold Mini Futures	0.000013	133.2	0.000
Gold Mini Options on Goods	0.0352	133.2	0.026

Production: Recycling + Other Sources is considered

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

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Annual average OI (MT)	Deliverable Supply (MT)	Annual average OI as proportion of deliverable supply (%)
Gold Mini Futures	0.000013	857.3	0.000
Gold Mini Options on Goods	0.0352	857.3	0.004

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

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Month	Rs Crores	
	Gold Mini Futures	Gold Mini Options on Goods
April 2023	1.2	1546.31
May 2023	1.56	1140.44
June 2023	1.44	214.79
July 2023	0.06	1.41
Aug 2023	NIL	NIL
Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	NIL	NA
Dec 2023	NIL	NA
Jan 2024	NIL	NA

Feb 2024	NIL	NA
Mar 2024	NIL	NA
FY 2023-24	4.26	2902.95

Options turnover is Notional turnover

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

The Deliveries for Gold Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Month	Grams	Grams
	Gold Mini Futures	Gold Mini Options on Goods
April 2023	NIL	1000
May 2023	NIL	1000
June 2023	NIL	1000
July 2023	NIL	4000
Aug 2023	NIL	NIL
Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	NIL	NA
Dec 2023	NIL	NA
Jan 2024	NIL	NA
Feb 2024	NIL	NA
Mar 2024	NIL	NA
FY 2023-24	NIL	7000

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

The Deliveries for Gold Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Month	Rs Crores	Rs Crores
	Gold Mini Futures	Gold Mini Options on Goods
April 2023	NIL	0.57
May 2023	NIL	0.60
June 2023	NIL	0.60
July 2023	NIL	2.38
Aug 2023	NIL	NIL
Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	NIL	NA
Dec 2023	NIL	NA
Jan 2024	NIL	NA
Feb 2024	NIL	NA
Mar 2024	NIL	NA
FY 2023-24	NIL	4.15

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

The OI for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Month	100 Grams	100 Grams
	Gold Mini Futures	Gold Mini Options on Goods
April 2023	0.52	1516.94
May 2023	0.52	663.91
June 2023	0.50	148.13
July 2023	NIL	26.85
Aug 2023	NIL	NIL
Sep 2023	NIL	NIL
Oct 2023	NIL	NIL
Nov 2023	NIL	NA
Dec 2023	NIL	NA
Jan 2024	NIL	NA
Feb 2024	NIL	NA
Mar 2024	NIL	NA
FY 2023-24	0.13	352.31

j. Annual average volume to open interest ratio

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Unit	Annual Average Traded Volume	Annual Average Open Interest	Annual average OI as a proportion of Annual average volume (%)
Gold Mini Futures	100 Grams	0.28	0.13	46.42
Gold Mini Options on Goods	100 Grams	352.75	352.31	99.88

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

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Unique Member Count	Unique Client Count
Gold Mini Futures	1	3
Gold Mini Options on Goods	67	91

I. 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 and VCPs/hedgers* for Gold Futures & Options on Futures, Gold Mini Futures & Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

The traded volume by FPOs / farmers and VCPs/hedgers* for Gold Mini Options (On Goods) was negligible, hence, the relevant information could not be appropriately derived.

* Based on the self-declaration available for the categorization of clients/members

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

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Unique FPOs / farmers and VCPs/hedgers*
Gold Mini Futures	NIL
Gold Mini Options on Goods	1

* Based on the self-declaration available for the categorization of clients/members

n. Algorithmic trading as percentage of total trading

The traded volume for Gold Futures & Options on Futures, Gold Mini Options on Futures, Gold 1G Futures and Gold Guinea Futures in FY 2023-24 was NIL.

Contract	Algorithmic trading as percentage of total trading (%)
Gold Mini Futures	0
Gold Mini Options on Goods	53.10

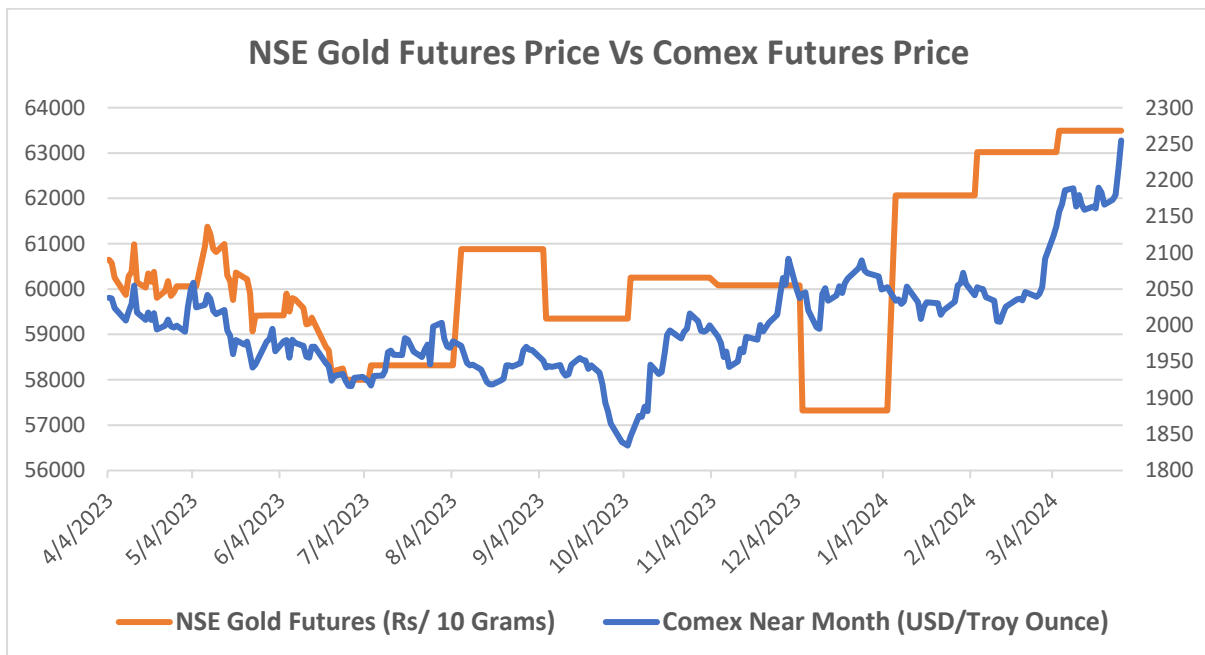
o. Delivery defaults

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

There were no instances of delivery default in Gold contracts in FY 2023-24.

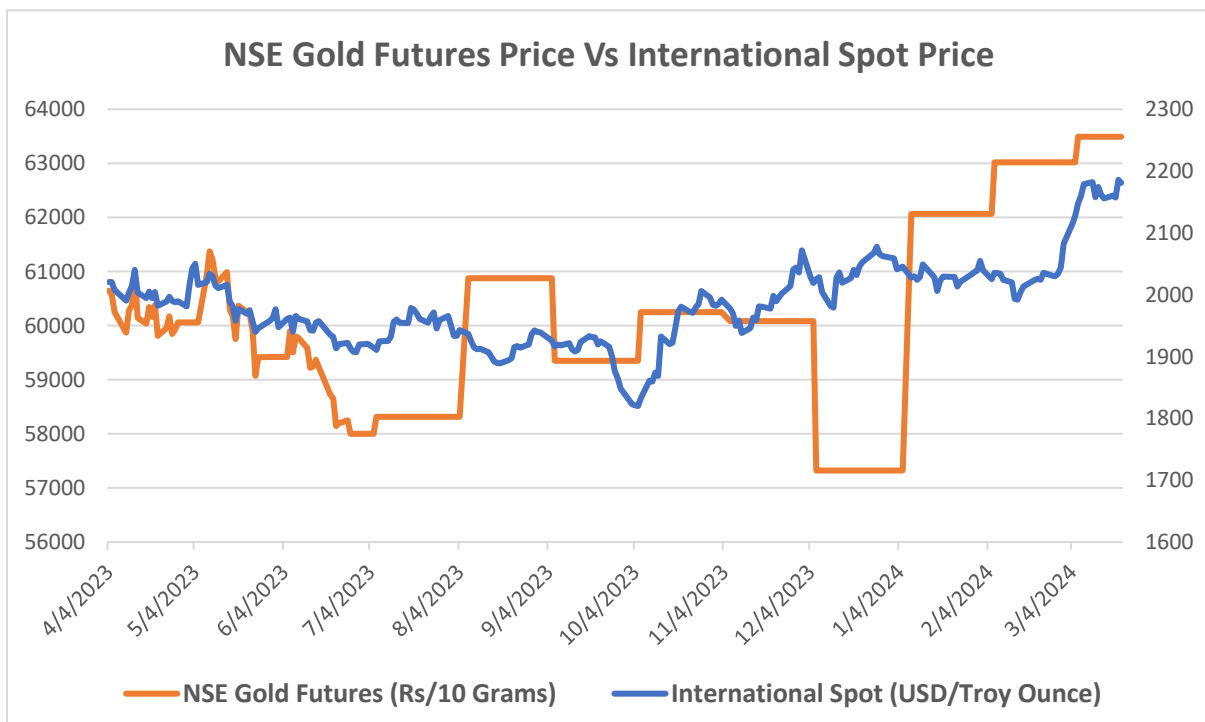
3. Price movements

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



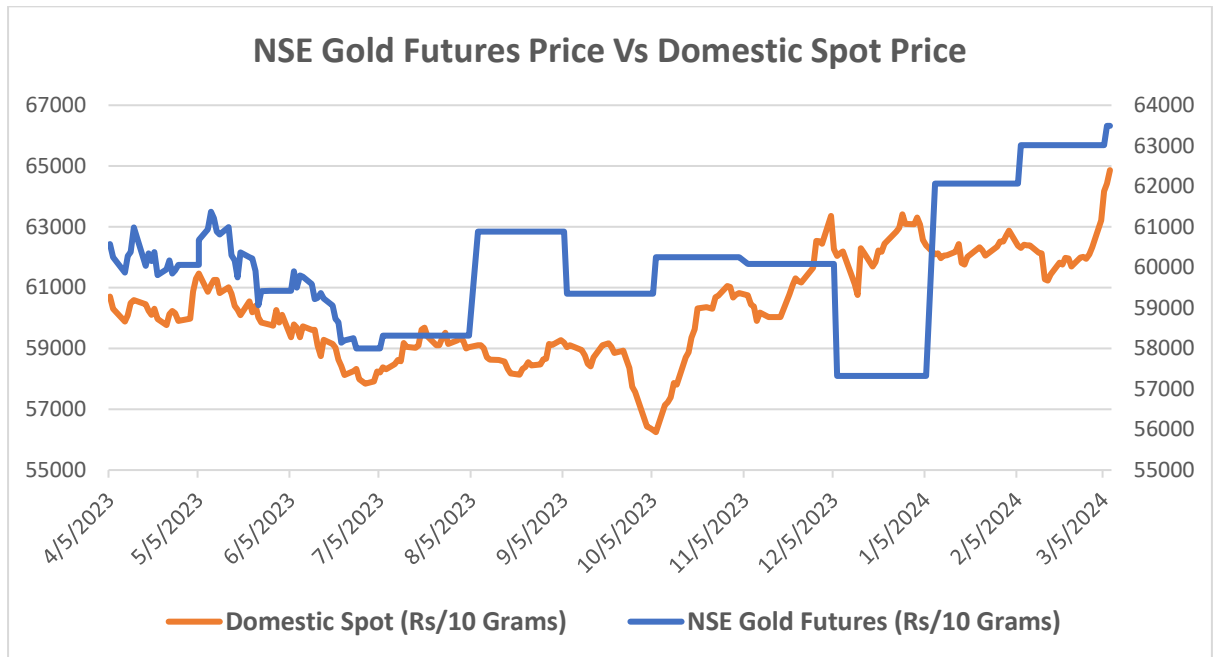
Correlation: 51% | Ratio of Std Deviation: 0.96

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).



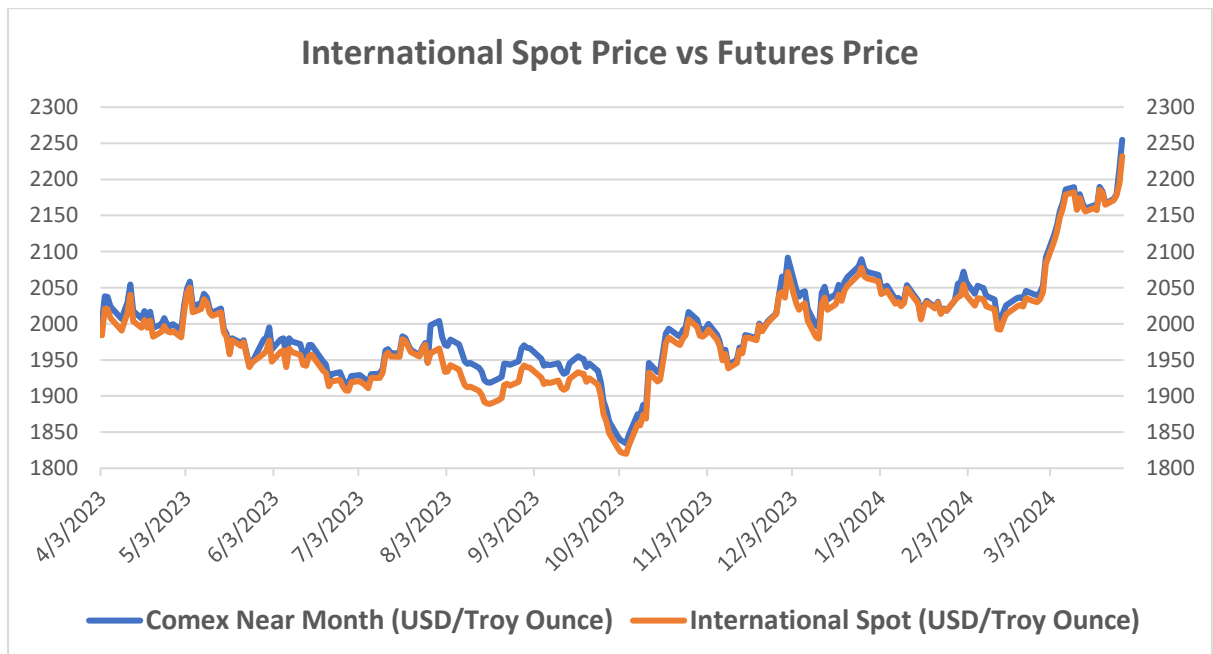
Correlation: 45% | Ratio of Std Deviation: 1.03

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



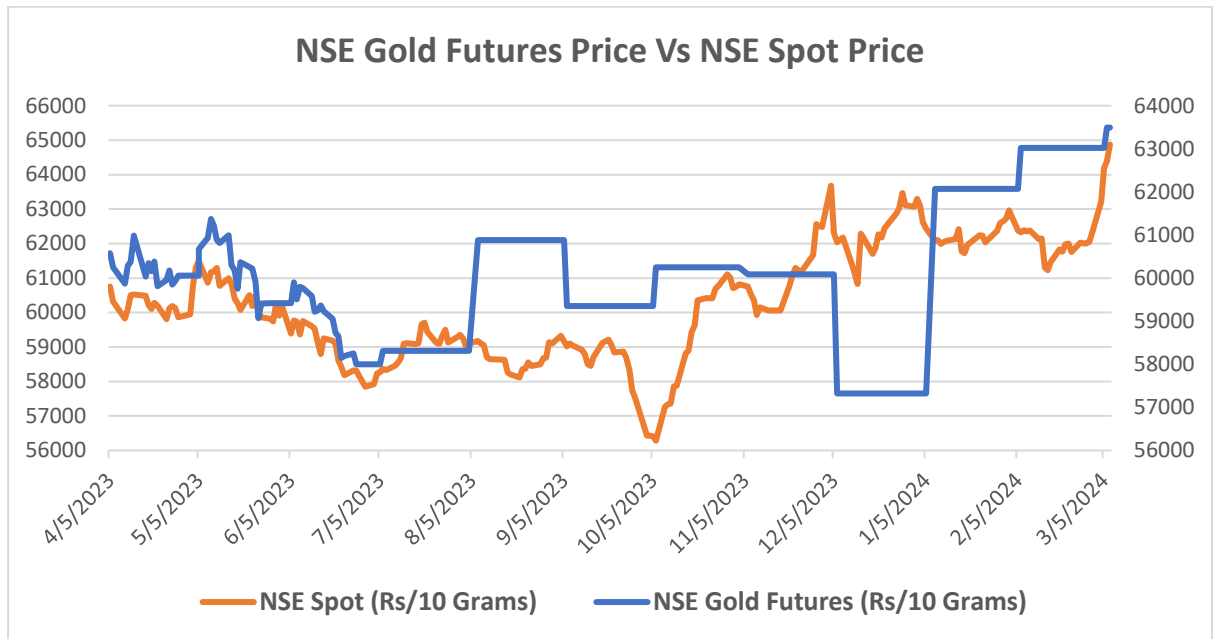
Correlation: 50% | Ratio of Std Deviation: 1.16

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



Correlation: 99% | Ratio of Std Deviation: 0.96

- 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: 50% | Ratio of Std Deviation: 1.16

- 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 (%)
Gold Mini Futures	NA	NA	2.386	0.001

Volatility calculation: $(\text{Day} - \text{Previous day's price}) / \text{Previous day's price}$

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.

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

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.

Hedge Effectiveness using Dollar Offset Method

Date	Price		Price Change		Hedge Effectiveness
	NSE GOLD Spot Price	NSE GOLD Futures	NSE GOLDM Spot Price	NSE GOLD Futures	
4/18/2023	52212	60345	-171	310	155.16
4/24/2023	51744	59955	-158	145	208.97
4/27/2023	52158	59931	15	81	81.48
5/8/2023	53049	60935	-275	260	205.77
5/16/2023	52771	60300	-358	-691	48.19
5/25/2023	51977	59070	-315	-844	62.68
6/8/2023	51532	59800	-413	295	240.00
6/22/2023	50592	58145	-201	-505	60.20
7/6/2023	50736	58315	-68	315	121.59
			Overall Average		131.56

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 Gold Futures) with the change in the fair value or present value of future cash flows of the hedged item (Gold 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 Gold 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 131.56%.

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 gold, after the GST introduction, location-based premiums and discounts have been more or less resolved. However, the most important source of basis risk for gold 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).

Gold demand in India can be broadly categorized into jewelry fabrication demands and investment demand, with the former accounting for around 80%. The domestic jewelry demand is primarily on account of wedding demand and festival demands (Akshaya Tritiya, Dhanteras etc.). This demand which comes from across the country stays throughout the year and is serviced from important gold centres like Delhi, Mumbai, Ahmedabad, Bangalore, Chennai, Kochi, Jaipur, Kolkata, and Hyderabad.

The below table provides a list of Top 5 major Bullion trading centres vis-à-vis NSE delivery centres

Major cities based on Gold import and consumption	NSE's delivery centre
Delhi	Additional Delivery Center
Kochi	NIL
Chennai	Additional Delivery Center
Ahmedabad	Primary Delivery Center
Kolkata	NIL

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.