Parameters for Performance Review of Commodity

Cotton

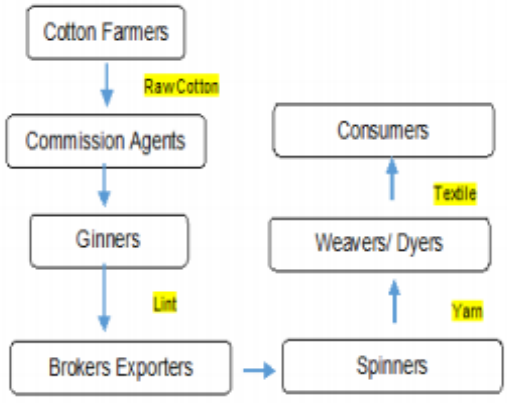
1. Background

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

Cotton is a soft fiber that grows around the seeds of the cotton plant (Gossypium spp.), a shrub native to the tropical and subtropical regions. The fiber is almost pure cellulose. Cotton fibre separated from seed cotton is referred as Cotton Lint. This Lint is then pressed in the form of full pressed bales with standard weight of 170 kgs. The fiber thus obtained is most often spun into yarn or thread and used to make a soft, breathable textile. Cotton is a natural fibre. Its widespread use is largely due to the ease with which its fibers are spun into yarns. Cotton's strength, absorbency, and capacity to be washed and dyed also make it adaptable to a considerable variety of textile products. Cotton yarns can be dyed and printed easily, so that they are useful for producing woven fabrics with a multitude of colors and designs.

Different species of cotton plants produce fibers of different lengths. Long-staple fibers are spun into fine, strong yarns, which are then woven into better-quality fabrics. Short-staple fibers produce coarser yarns for durable fabrics. India produce large number of varieties and hybrids, number of varieties in cultivation exceeds seventy-five. However, 98% of the production is contributed by about 25 varieties.

Cotton lint is used to make a number of textile products viz. terrycloth, bath towels and robes; denim, used to make blue jeans; twill. Socks, underwear, and most T-shirts are made from cotton. Bed sheets are often made from Cotton. Cotton is also used to make yarn used in crochet and knitting. Fabric can also be made from recycled or recovered cotton that would otherwise be thrown away during the spinning, weaving or cutting process.

<table>
<tr><th>Life Cycle:
Value Chain of the Commodity</th><th>Major Varieties /Grade</th></tr>
<tr><td> 
</td><td>Major Varieties

Bengal Desi, Assam Comilla, V797/G-Cot-13, J-34 Hybrid, LRA 5166, H-4/H6/MECH, Sanker-6/10, Bunny / Brahma, MCU-5 /Surabhi, DCH-32

NCDEX: Important Quality Parameters
<table>
<tr><td>Staple Length</td><td>Staple 2.5% span length: Basis 29 mm (-1mm) with discount.</td></tr>
<tr><td>Strength</td><td>Basis: Min. 28 G/Tex with no premium above 28 G/Tex</td></tr>
<tr><td>Micronaire</td><td>3.6 – 4.8</td></tr>
<tr><td>Colour grade</td><td>Basis Grade RD (Reflectance) value and +b (Yellowness):
Basis 75 RD value (-2RD value) with discount
Below 75- upto 74 RD – Discount 1% PRO RATA</td></tr>
</table></td></tr>
</table>

		Below 74 upto 73- Additional Discount of 1.5% Below 73 RD value reject. +b upto 10.2 accept, +b above 10.2 reject.
	Trash content	Basis 3.5%
	Moisture	Basis 8.5%
	Short Fibre Index	Maximum 8.5

Table: Reference Years for Commodities

Sl. No.	A	B	C
Crop Season	**Kharif**	**Kharif (Long Duration crop)**	**Rabi**
Crops	Paddy, Maize, Bajra, Moong, Soybean, Guar seed, Kapas, Sesame Seed	Castor seed and Turmeric	Wheat, Barley, Chana, RM Seed, Coriander, Jeera
Relevant Processed commodities	Guar gum, Soybean meal, Soy oil, Cotton, Cotton seed Oil cake, Gur, CPO	Castor Oil	-
Sowing Time	July onwards	July onwards	October onwards
Harvesting Time	Oct onwards	Jan onwards	March onwards
Reference Year Financial Year 2022-23 (Apr-Mar)			
Corresponding Years			
Production Year (PY)	2022-23 (July-Sept)	2021-22 (July-June)	2021-22 (July-June)
Marketing Year (MY)	2022-23(Oct-Sept)	2022-23 (Jan/Feb-Dec/Jan)	2022-23 (Mar/Apr - Feb/Mar)
Calendar Year (CY)	2022 (Jan-Dec)	2022 (Jan-Dec)	2022 (Jan-Dec)
Relationship b/w Various Years	Current Financial Year = Current Production Year = Current Marketing Year = Calendar Year	Current Financial Year = Previous Production Year = Current Marketing Year = Current Calendar Year	Current Financial Year = Previous Production Year = Current Marketing Year = Current Calendar Year
Example	FY 2022-23= PY 2022-23= MY 2022-23= CY 2022	FY 2022-23= PY 2021-22 = MY 2022-23= CY 2022	FY 2022-23= PY 2021-22 = MY 2022-23= CY 2022

Note: Coffee is a plantation crop; hence, it is not classified under either Kharif or Rabi season in the above table.

Explanatory Notes:

- India is a vast country and various crops are sown and harvested at different point of time. However, two major crop seasons, are there i.e. Kharif & Rabi. Apart from it, Zaid/Summer season is also there.

- Crop seasons are classified based upon sowing time. Normally Kharif season sowing starts from mid-June/July and new crop arrivals begin from Oct/Nov. However, early/late sowing/harvesting also takes place. Rabi season sowing usually takes place mainly from October/November and harvesting starts from March/April. Early/late sowing/harvesting also takes place. Summer crops/Zaid crops are short duration crops mainly sown during January-March and harvested during April-June.

- "Production Year" is considered as "July to June". With the start of monsoon rains during June/July the sowing of Kharif season starts and they are harvested during Sept/Oct. From Oct onwards the sowing of Rabi season crops starts and harvesting usually takes place during March/April. Thus, a single production cycle completes between July-Sept period covering Kharif, Rabi and Zaid crops. Thus production year remains same for all season crops and the period corresponds to July-Sept.

- "Marketing Year" for each crops starts from beginning of the harvest time i.e. from start of new crop produce arrivals in the market. Thus, for Kharif crops Marketing Year is generally considered as "October to September", while for Rabi crops Marketing Year is considered as "April to March". However, Marketing Year may vary slightly for some of the crops depending upon early/late maturity/harvesting.

- For processed commodities, their production starts after the start of new season crop arrivals of their underlying crop.

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 (quantity)

(Lakh bales of 170 Kg each)

Global Scenario	Previous FY (2021-22)	Current FY (2022-23) (P)
Opening Stocks	1105.27	1104.32
Production	1485.83	1484.61
Imports	546.80	497.32
Total Supply	3137.89	3086.25
Exports	548.90	497.70
Domestic Consumption	1489.37	1411.02
Closing Stocks	1104.32	1178.43

Source: USDA (April 2023); P= Provisional,

(Lakh bales of 170 Kg each)

Indian Scenario	Previous FY (2021-22)	Current FY (2022-23) (P)
Opening Stocks	71.84	45.60
Production	312.03	341.91
Imports	18.00	10.00
Total Supply	401.87	397.51
Exports	42.50	40.00
Domestic Consumption	313.77	311.00
Closing Stocks	45.60	46.51

Source: As estimated by Committee on Cotton Production and Consumption (COCPC) in its meeting held on Nov 15, 2022, P= Provisional

(Lakh bales of 170 Kg each)

Rank	Top 10 Major Producing Countries			Top 10 Major Consuming Countries		
	Country	Previous FY (2021-22)	Current FY (2022-23) (P)	Country	Previous FY (2021-22)	Current FY (2022-23) (P)
1	China	343.24	390.62	China	432.25	467.47
2	India	312.50	313.78	India	320.18	288.16
3	United States	224.42	188.01	Pakistan	137.04	110.14
4	Brazil	150.10	166.49	Bangladesh	108.86	101.18
5	Australia	74.92	70.44	Turkey	111.42	96.05
6	Turkey	48.67	62.76	Vietnam	85.81	80.69
7	Pakistan	76.84	49.95	Brazil	42.26	40.98
8	Uzbekistan	37.14	37.14	Uzbekistan	42.26	37.14
9	Greece	17.93	18.57	United States	32.66	26.90
10	Mexico	15.62	17.93	Indonesia	33.30	23.69
	Others	184.44	168.92	Others	143.33	138.61
	World Total	1485.83	1484.61	World Total	1489.37	1411.02

Source: USDA (April 2023); P= Provisional,

(Lakh bales of 170 Kg each)

Rank	Top 10 Major Exporting Countries			Top 10 Major Importing Countries		
	Country	Previous FY (2021-22)	Current FY (2022-23) (P)	Country	Previous FY (2021-22)	Current FY (2022-23) (P)
1	United States	187.27	156.25	Bangladesh	105.02	94.77
2	Brazil	98.96	91.57	China	100.41	92.85
3	Australia	45.81	80.69	Vietnam	84.93	80.69
4	India	47.94	23.05	Pakistan	57.63	55.07
5	Greece	18.29	16.33	Turkey	70.75	51.23
6	Benin	17.93	15.37	India	12.81	22.41
7	Mali	16.65	12.17	Indonesia	33.00	22.41
8	Burkina Faso	11.53	11.01	Mexico	12.28	11.53
9	Turkey	7.26	8.97	Thailand	9.61	9.29
10	Cameroon	7.68	8.00	Malaysia	5.69	7.04
	Others	89.57	74.30	Others	54.67	50.03
	World Total	548.90	497.70	World Total	546.80	497.32

Source: USDA (April 2022); P= Provisional,
Countries are arranged in descending order based on the figure in Current FY (2022-23) (P)
Please refer to Table entitled “Reference Years for Commodities” to know type of years corresponding to financial year.

(Lakh bales of 170 Kg each)

Top 10 Major Cotton producing states in India			
Rank	State	Previous FY (2021-22) (P)	Current FY (2022-23) (P)
1	Gujarat	74.82	91.83
2	Maharashtra	71.18	80.25
3	Telangana	60.67	53.25
4	Rajasthan	24.81	27.12
5	Karnataka	19.50	21.04
6	Andhra Pradesh	17.08	17.85
7	Haryana	13.16	17.21
8	Madhya Pradesh	14.20	15.19
9	Punjab	6.47	9.22
10	Orissa	6.26	6.82

	Others	3.88	2.13
	All India Level	312.03	341.91

Source: As estimated by Committee on Cotton Production and Consumption (COCPC) in its meeting held on Nov 15, 2022, P= Provisional,

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

Date	Major Policies governing trade and related changes
13-Apr-22	The central Govt. exempted custom duty on cotton import w.e.f. Apr 14 till Sept 30, 2022.
08-06-2022	Government has increased the Minimum Support Price of Kharif crops for the Marketing Year 2022- 23. Cotton MSP has increased to Rs. 6080 (+ 6%) per quintal for medium staple and Rs. 6380 (+ 6%) per quintal for long staple cotton as compared to price for medium staple at Rs. 5726 per quintal and Rs. 6025 for long staple during the 2021-22.
18-06-2022	The Cotton Association of India revised downward its cotton crop estimate for 2021-22 by 8.31 lakh bales to 315.32 lakh bales of 170 kgs. Each
04-Jul-22	The Centre has extended the window for duty-free imports of raw cotton till October 31, 2022 from the earlier deadline of September 30, 2022
18-Oct-22	CAI in the final estimates of the Cotton crop for the 2021-22 season, has pegged production at 307.5 lakh bales (each of 170 kg raw cotton) against 360.13 lakh bales estimated at the beginning of the season.
18-Oct-22	CAI, in its first estimate for the 2022-23, has projected the Cotton crop at 344 lakh bales as against 307.5 lakh bales produced in the last season.
14-Jan-23	Cotton Association of India (CAI) further revised the Cotton crop estimate for 2022-23 season to 330.50 lakh bales, lower by 3% as compared with previous estimate of 339.75 Lakh Bales in December 2022.
01-Feb-23	The government has announced a scheme for increasing the production of Extra Long Staple Cotton in the country under Cluster Development Initiative through PPP mode.
14-Feb-23	CAI revised the 2022-23 Cotton crop estimate downward by 3% to 321.50 lakh bales against 330.50 Lakh Bales estimated in January 2023.
16-Mar-23	CAI (Cotton Association of India) Cotton crop estimates for crop year 2022-23 was further lowered to 313 lakh bales

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

Date	Event	Key Details	Key Implications/Impact
	No Cotton specific Geo-political issues were seen during review period	NA	NA

NA: Not Applicable

2. Trading-related parameter

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

Monthly Traded Volume		
Month	**Year**	**Traded Volume (MT)**
April	2022	-
May	2022	-
June	2022	-
July	2022	-
August	2022	-
September	2022	-
October	2022	-
November	2022	-
December	2022	4
January	2023	2
February	2023	-
March	2023	2
Yearly Traded Volume		**8**

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

SYMBOL	Traded volume (MT)	Deliverable supply(MT)	Proportion
COTTON	8.00	39,751,000	0.00

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

SYMBOL	Traded volume (MT)	Production(MT)	Proportion
COTTON	8	34,191,000	0.00

d. Annual average Open interest as proportion of total production

SYMBOL	Avg Open Int (MT)	Production(MT)	Proportion
COTTON	0.55	34,191,000	0.00

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

SYMBOL	Avg Open Int (MT)	Deliverable supply(MT)	Proportion
COTTON	0.55	39,751,000	0.00

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

Monthly Traded Value		
Month	**Year**	**Traded Value(in Cr.)**
April	2022	-
May	2022	-
June	2022	-
July	2022	-
August	2022	-
September	2022	-
October	2022	-
November	2022	-
December	2022	1.23
January	2023	0.61
February	2023	-
March	2023	0.60
Yearly Value of Trade		**2.43**

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

NA

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

NA

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

Month	Year	Avg Open Int (MT)
April	2022	-
May	2022	-
June	2022	-
July	2022	-
August	2022	-
September	2022	-
October	2022	-
November	2022	-
December	2022	1.09
January	2023	3.05
February	2023	2.00
March	2023	0.48
Yearly Average OI		**0.55**

j. Annual average volume to open interest ratio

Volume to OI Ratio
5.80%

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

Member Count	Client Count
2	2

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

	VCPs/ Hedger
Annual Average	N.A.
Maximum Daily value*	0.00%

It is calculated on the day when commodity has highest open interest during the year.
Commodity wise client categorization is as per category details as provided by the members.

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

Commodity	Count
COTTON	0

Commodity wise client categorization is as per category details as provided by the members.

n. Algorithmic trading as percentage of total trading

Commodity	%
COTTON	0

o. Delivery defaults

No. of Instances	0
Quantity Involved (MT)	0
Value Involved (Cr)	0

3. Price Movements

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

Correlation			
	Futures	*Spot*	*Int'l Futures*
Futures	1	0.909403	0.098353
Spot	0.909403	1	0.102442
Int'l Futures	0.098353	0.102442	1

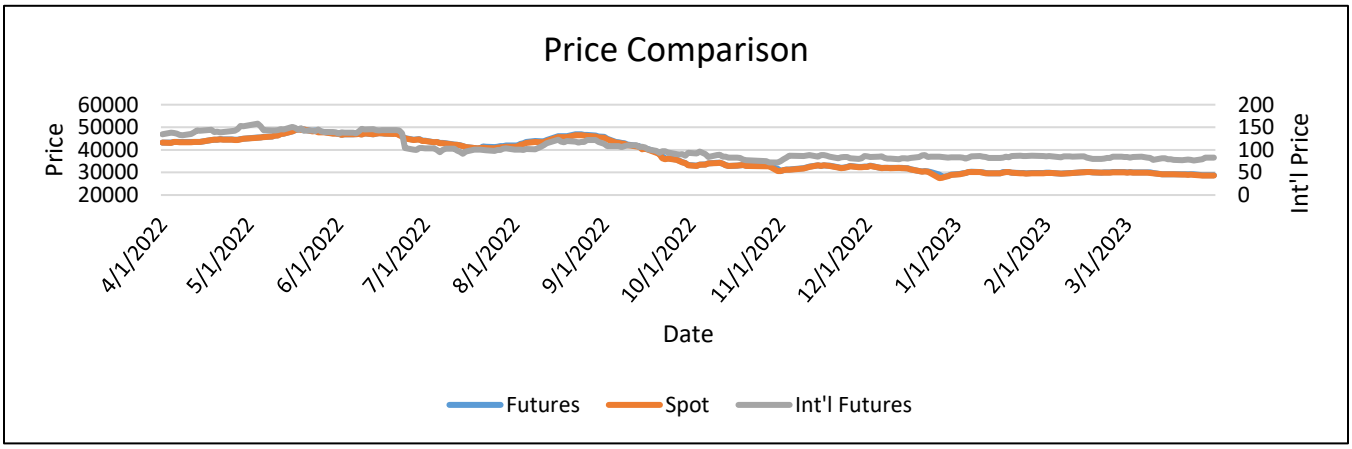
Standard Deviation			
	Futures	*Spot*	*Int'l Futures*
Futures	1	1.084569	2.701765284
Spot	0.922025	1	2.491094804
Int'l Futures	0.370128	0.40143	1

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

International Spot prices not readily available in public domain.

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

NA



Source: Spot and Future Prices: NCDEX, Int'l Futures Prices : ICE

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

Spot Price Volatility		
	Month	**Value**
Max	Dec	0.01916
Min	Feb	0.003886

Future Price Volatility		
Volatility	**Month**	**Value**
Max	Dec	0.013932
Min	Feb	0.003878

(Value of daily futures price volatility spot price volatility for period April 2022- March 2023

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

Contango	0
Backwardation	15

Note: 29mm cotton not liquid during in FY 2022-23

4. Others 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

Basis Volatility	2.970114173
Hedging Efficiency	99.25%

The methodology for hedge efficiency ratio calculation is appended as Annexure 1

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).

State	Major Trading Centre	Exchange Delivery Centre
Gujarat	Kadi	ADC
	Rajkot	Basis Centre
	Surendranagar	
	Viramgam	
	Vijapur	
	Halvad	
	Dhrangadhra	
	Wakaner	
	Tankara	
	Morbi	
	Taragadhi	
	Padadhari	
	Shapar	
	Hadamtala	
	Gondal	
	Jasdan	
	Amreli	
	Bhavnagar	
	Botad	
	Himmatnagar	NA

Telegana / Andhra Pradesh	Hyderabad	
	Adilabad	
	Warrangal	
Maharashtra	Aurangabad	NA
	Akola	ADC
	Yavatmal	
	Jalgaon	
	Beed	
	Parbhani	
	Nanded	
	Jalna	
	Amravati	
	Murtizapur	NA
	Akot	
	Khamgaon	
	Hinganghat	
	Dhule	
Madhya Pradesh	Indore	
	Khargone	NA
Punjab and Hariyana	Abohar	
	Malaout	NA

	Bathinda	
	Ludhiana	
	Hisar	
	Sirsa	
Rajasthan	Sri Ganganagar	
	Bhilwara	
	Hanumangarh	
	Suratgarh	
	Jaipur	NA
Tamilnadu	Erode	
	Salem	NA
Karnataka	Bijapur	NA

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

State	Maharashtra
Apr-22	0
May-22	0
Jun-22	0
Jul-22	0
Aug-22	0
Sep-22	0
Oct-22	0
Nov-22	0
Dec-22	2
Jan-23	6
Feb-23	4
Mar-23	1

29mm cotton not liquid during FY 2022-23

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

Sr. No.	Program Type	Location	Participants
1	Investor Awareness Program	Lucknow	38
2	Investor Awareness Program	Kadi	35

3	Investor Awareness Program	Kolkata	35
4	Investor Awareness Program	Surat	18
5	Investor Awareness Program	Guna, Madhya Pradesh	30
6	Investor Awareness Program	Anjar, Lutch, Gujarat	38
7	Investor Awareness Program	Raipur, Chhattisgarh	112
8	Investor Awareness Program	Patan, Gujarat	104
9	Investor Awareness Program	Nashik	200
10	Investor Awareness Program	Udaipur	150
11	Investor Awareness Program	Rajkot	100
12	Investor Awareness Program	Hissar	100
13	Investor Awareness Program	Nagpur, Maharashtra	120
14	Investor Awareness Program	Raipur	100
15	Investor Awareness Program	Gwalior, Madhya Pradesh	78
16	Investor Awareness Program	Bhopal , MP	54
17	Investor Awareness Program	Indore, Madhya Pradesh	47
18	Investor Awareness Program	Siliguri, West Bengal	39
19	Investor Awareness Program	Alipurduar, West Bengal	31
20	Investor Awareness Program	Meerut, Uttar Pradesh	30
21	Investor Awareness Program	Bhopal, Madhya Pradesh	44
22	Investor Awareness Program	Indore, Madhya Pradesh	80
23	Investor Awareness Program	Chennai, Tamil Nadu	24
24	Investor Awareness Program	Kanpur, Uttar Pradesh	60
25	Investor Awareness Program	Chindwara, MP	50
26	Investor Awareness Program	Seoni , MP	40
27	Investor Awareness Program	Kolkata	25

28	Investor Awareness Program	Raipur, Chattisgarh	136
29	Investor Awareness Program	Lucknow	177
30	Investor Awareness Program	Rourkela	65
31	Investor Awareness Program	Muzaffarnagar	70
32	Investor Awareness Program	Kochi	86
33	Investor Awareness Program	Bhilai	70
34	Investor Awareness Program	Thalamadla	80
35	Investor Awareness Program	Kolkata	45
36	Investor Awareness Program	Online	30
37	Investor Awareness Program	Online	18
38	Investor Awareness Program	Online	23
39	Investor Awareness Program	Odisha	9
40	Investor Awareness Program	Odisha	15
41	Investor Awareness Program	Karnataka	5
42	Investor Awareness Program	Bihar	18
43	Investor Awareness Program	West Bengal	6
44	Investor Awareness Program	Andhra Pradesh	29
45	Investor Awareness Program	Online	11
46	Investor Awareness Program	Online	7
47	Investor Awareness Program	Online	21
48	Investor Awareness Program	Online	6
49	Investor Awareness Program	Online	9
50	Investor Awareness Program	Online	14
51	Investor Awareness Program	Online	82
52	Investor Awareness Program	Online	28
53	Investor Awareness Program	Online	25
54	Investor Awareness Program	Online	50
55	Investor Awareness Program	Online	30
56	Investor Awareness Program	Online	25
57	Investor Awareness Program	Online	5
58	Investor Awareness Program	Online	10
59	Investor Awareness Program	Online	7
60	Investor Awareness Program	Online	13
61	Investor Awareness Program	Online	16
62	Investor Awareness Program	Online	23
63	Investor Awareness Program	Online	53
64	Investor Awareness Program	Online	17
65	Investor Awareness Program	Online	30
66	Investor Awareness Program	Online	15
67	Investor Awareness Program	Online	25
68	Investor Awareness Program	Online	35

69	Investor Awareness Program	Online	10
70	Investor Awareness Program	Online	30
71	Investor Awareness Program	Online	12
72	Investor Awareness Program	Online	6
73	Investor Awareness Program	Online	7
74	Investor Awareness Program	Online	20
75	Investor Awareness Program	Online	50
76	Investor Awareness Program	Online	30
77	Investor Awareness Program	Online	13
78	Investor Awareness Program	Online	10
79	Investor Awareness Program	Online	6
80	Investor Awareness Program	Online	6
81	Investor Awareness Program	Online	8
82	Investor Awareness Program	Online	13
83	Investor Awareness Program	Online	6
84	Investor Awareness Program	Online	25
85	Investor Awareness Program	Online	8
86	Investor Awareness Program	Online	14
87	Investor Awareness Program	Online	11
88	Investor Awareness Program	Online	10
89	Investor Awareness Program	Online	6
90	Investor Awareness Program	Online	9
91	Investor Awareness Program	Online	14
92	Investor Awareness Program	Online	16
93	Investor Awareness Program	Online	11
94	Investor Awareness Program	Online	8
95	Investor Awareness Program	Online	8
96	Investor Awareness Program	Online	13
97	Investor Awareness Program	Online	15
98	Investor Awareness Program	Online	25
99	Investor Awareness Program	Online	25
100	Investor Awareness Program	Online	26
101	Investor Awareness Program	Online	18
102	Investor Awareness Program	Online	52
103	Investor Awareness Program	Online	16

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

- Creating an awareness about the Hedge policy to bona fide hedger
- Online webinar conducted to increase hedging participation from the value chain participants.
- One to one meetings with market participants create awareness about new

development / newinitiatives at exchange level.

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

NA

ANNEXURE I

Qualitative and quantitative measure for Hedge effectiveness ratio

Hedging Efficiency Methodology

Regression analysis is carried out between near month futures returns and NCDEX polled spot prices returns of the FY2022-23.

The R-Square value of the Regression analysis represents the “Hedging Efficiency”.

Note: -

Date for which spot prices were not available is not used for analysis.

Weekly returns are used for performing Regression Analysis.

The method used to calculate Hedging Efficiency does not consider liquidity risk because of this reason illiquid commodities can have high hedging efficiency.

References:

Ghosh, Ph.D, Nilanjan & Dey, Debojyoti & Moulvi, Nazir & Jain, Niteen & Sinha, Neha & Rachuri, Sarika. (2013). Hedging Efficiency—Measures and Empirical Study.