Commodity Price Risk Management : Analysis of Lead Hedging on MCX by an Indian Battery Maker

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Abstract

For commodity buyers, rising prices lead to the risk of shrinking profit margins. When the commodity used for making some product or providing some service accounts for a large percentage of the total operating costs, hedging is acknowledged as a prudent price risk management strategy. This paper is an objective analysis of the long hedge built by a theoretical Indian battery maker using the Multi Commodity Exchange (MCX) of India listed lead contracts. The battery maker/lead buyer's hedge is studied to understand the aim with which the hedge was constructed, and the outcome of the hedge. The paper also identifies the advantages and disadvantages of hedging with futures contracts, and examines how hedging replaces price risk with basis risk. The paper further looks at the alternatives available to commodity buyers for hedging. The hedge analysis that forms the core of this paper is based on actual data taken from MCX.

I. Introduction

LEAD PRICES IN India are influenced by several domestic as well as international factors, and India takes the prices from international markets. Lead prices in the international markets rallied during the months from June to December 2016, andcrossed above US $ 2,500 per metric ton(Figure 1). The prices of lead, and similarly the entire metal complex, were being driven by the increasing appetite of hedge funds for industrial metals. Between June and December 2016, lead prices in Indiaalso rose sharply from ₹ 113/kg. to ₹ 135/kg., touching a high of nearly ₹ 170/kg. in late November 2016.

This sharp rise in lead prices was a matter of concern for all those who were short lead in the physical markets. For automotive and industrial battery makers, lead is the key input, and may account for nearly 70% of their operating costs. Being part of extremely competitive markets, profitability of battery makers is directly linked to lead prices, as passing on such price rises to customers is not a possibility. For instance, in the quarter ended

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ii. *Forward Contracts* : The lead buyer could also have achieved a fixed
buying price for lead for the coming months by bilaterally negotiating
and entering into a forward contract with the lead supplier. However,
lead suppliers may not want to enter into such contracts, especially for
the longer term, when lead prices are expected to rise.

iii. *Swaps* : When the lead supplier is not a willing counterparty for a fixed
price contract, swap contracts with an intermediary willing to exchange
the unpredictable cashflows for buying lead with a fixed cashflow based
on a fixed price or an index could be one option, but in the commodity
markets, swaps are not prevalent, except for crude oil.

iv. *Backward Integration* : If it could be clear that lead prices were on a long
upward trend, then lead buyers could make long-term plans to be hedged
against the rising cost of lead and go for a strategy of backward-
integration by acquiring a lead smelter. Owning a local smelter could
prove to be a strategically significant approach as it could afford the
lead buyer access to recycled lead and reduce dependence on imported
lead. The smelter could also be useful in recycling of lead from the
batteries, and as part of corporate social responsibility initiatives, and
increase the battery makers' commitment to protect the environment.
However, most often, any capital expenditure decisions like acquiring
a smelter need time to be thought through. In the meanwhile, with lead
prices already showing a rise, waiting for a trend to become clear to
define any hedging strategies could lead to detrimental delays, and
remaining hedged for the near future was the prudent approach to price
risk management.

VI. Conclusion

Hedging is necessary for commodity buyers and sellers who face threats
to their profit margins on account of volatile and unpredictable commodity
prices. Derivative contracts are tools available to transfer price risk from the
risk-averse to the risk-seekers. This paper analysed the hedging strategy
used by a lead buyer to lock-in the buying prices of lead for futures months.
The paper examined the reasons how the lead buyer benefitted from hedging
away price risk, and assuming another risk called basis risk in its place.
The nuances of hedging, and some other alternatives available for price risk
management have also been presented in this paper.

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Annexure I
Contract Specification of Lead

Symbol	LEAD
Description	LEADMMYY
Contract Listing	Contracts are available as per the Contract Launch Calendar.
Contract Start Day	1ST day of contract launch month. If 1st day is a holiday then the following working day.
Last Trading Day	Last calendar day of the contract expiry month. If last calendar day is a holiday or Saturday then preceding working day.

Trading	
Trading Period	Mondays through Friday
Trading Session	Monday to Friday :10.00am to 11.30 p.m./11.55 p.m.**based on US daylight saving time period.
Trading Unit	5 tons
Quotation /Base Value	Rs. per kg
Price Quote	Ex-Bhiwandi (exclusive of all taxes and levies relating to import, customs, Sales Tax/VAT as the case may be, special additional duty and octroi).At the time of delivery ,the buyer has to pay these taxes and levies in addition to Delivery order rate.
Maximum Order Size	100 tons
Tick Size (Minimum Price Movement)	5 paise per kg
Daily Price Limits	The base price limit will be 4%. Whenever the base daily price limit is breached, the relaxation will be allowed upto 6% without any cooling off period in the trade. In cases the daily price limit of 6% is also breached, then after cooling off period of 15 minutes, the daily price limit will be relaxed upto 9%.In case price movement in international markets is more than the maximum daily price limit (currently 9%), the same may be further relaxed in steps of 3%.
Initial Margin	Minimum 4% or based on SPAIN whichever is higher.
Extreme Loss Margin	1%
Additional and /or Special Margin	In case of additional volatility, an additional margin (on both buy & Sell side) and /or special margin (on either buy or sell side)at such percentage, as deemed fit; will be imposed in respect of all outstanding positions.
Maximum Allowable Open Position	For individual clients: 3500 MT or 5% of the market wide open position, whichever is higher for all Lead contracts combined together. For a member collectively for all clients; 3500 MT o20% of the market wide open position, whichever is higher, for all Lead contracts combined together.

Delivery	
Delivery Unit	10 tons with tolerance limit of +/- 1% (100 Kgs)
Delivery Period Margin	25%
Delivery Centre	Within 20 Kilometers outside Mumbai octroi limit
Quality Specifications	Lead of 99.97% minimum purity. Lead must conform with graded lead chemical composition of BS EN 12659:1999 Standard entitled "Lead and Lead Alloys –Lead."Form : Ingots (pigs will be referred to as ingots)
Due Date Rate	Due date rate shall be the official Cash mid-Price (i.e. average of last bid and offer prices), in Indian Rupees per kilogram, of the London Metal Exchange's (LME) Lead at the end of the second ring Lead session on the last trading day of MCX Lead contract .The Last available RBI USDINR reference rate will be used for the conversion .The price so arrived will be rounded off to the market tick. On the day of expiry, the trading shall be allowed up to 5.20 p.m./6.20 p.m. IST based on second ring session trading timings for Lead at LME. For e.g. On the day of expiry, if LME Official cash bid and offer prices are US\$1669 and US\$1670 per MT respectively and the last available RBI USDINR reference rate is 66.1105, then DDR for MCX Lead contract would be Rs.110.35 (i.e. average of (US\$1669 and US\$1670)* 66.1105, divided y 1000 and rounded off to the nearest tick.)
Delivery Logic	Both Option

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Contract Launch Calendar of Lead

Contract Launch Months	Contract Expiry Months
September 2016	January 2017
October 2016	February 2017
November 2016	March 2017
December 2016	April 2017
January 2017	May 2017
February 2017	June 2017
March 2017	July 2017
April 2017	August2017
May 2017	September 2017
June 2017	October 2017
July 2017	November 2017
August2017	December 2017

Annexure II
Lead Spot Prices and January-February-March 2017 Expiry Lead Contract Prices and Volumes Traded From 1st December 2016 to 31st January 2017

(All prices in ₹/kg)

Date	Spot Price (₹)	Jan-17 Expiry	Volume	Feb-17 Expiry	Volume	Mar-17 Expiry	Volume
31-01-2017	159.65	159.65	7051	159.60	9832	159.90	75
30-01-2017	157.85	160.45	12410	159.60	2253	158.05	11
27-01-2017	161.25	156.25	17726	155.55	1985	157.45	6
25-01-2017	162.10	162.75	15530	162.15	816	163.10	2
24-01-2017	162.85	163.25	14273	163.00	608	163.00	2
23-01-2017	160.00	159.70	10689	159.75	554	159.80	0
20-01-2017	157.20	157.15	15059	157.50	445	156.55	2
19-01-2017	157.80	155.80	12406	155.85	480	155.90	1
18-01-2017	156.45	156.50	15486	156.75	319	156.60	3
17-01-2017	154.30	155.50	15590	155.90	441	153.20	4
16-01-2017	157.80	154.80	17402	155.35	596	157.50	1
13-01-2017	151.50	156.50	19258	156.90	564	153.60	12
12-01-2017	149.05	150.45	14651	150.95	298	149.75	5
11-01-2017	147.70	145.80	17436	146.60	545	147.45	0
10-01-2017	145.90	148.85	14016	149.30	328	149.75	0
09-01-2017	140.40	143.75	12034	144.20	217	144.65	0
06-01-2017	138.65	140.60	10394	141.20	218	141.85	0
05-01-2017	139.35	138.60	10137	139.10	154	139.65	0
04-01-2017	138.15	141.25	13639	141.70	235	142.15	0
03-01-2017	136.65	137.90	15392	138.50	205	138.65	2
02-01-2017	134.80	136.95	2142	137.60	20	138.30	0
30-12-2016	134.80	135.95	9507	136.55	108	137.20	0
29-12-2016	135.60	133.90	2337	136.40	4	136.10	0
28-12-2016	141.15	137.65	1554	139.05	7	138.90	0
27-12-2016	141.65	140.70	472	140.55	4	141.30	0
26-12-2016	141.65	137.65	348	137.65	0	137.65	0
23-12-2016	141.65	139.30	665	144.40	3	140.45	0
22-12-2016	142.05	144.55	507	145.55	26	145.70	0
21-12-2016	147.10	147.65	234	148.55	3	149.20	0
20-12-2016	148.20	149.00	339	149.60	0	150.25	0
19-12-2016	147.95	147.25	345	147.65	1	148.60	0
16-12-2016	153.35	152.65	313	153.00	1	153.75	0
15-12-2016	156.85	157.85	293	158.30	0	158.85	0
14-12-2016	158.20	158.35	211	158.95	0	159.60	0
13-12-2016	160.40	158.55	305	159.70	4	159.75	2
12-12-2016	156.10	158.00	87	156.70	1	156.75	1
09-12-2016	156.10	156.40	89	156.10	4	156.15	1
08-12-2016	157.15	153.95	114	154.55	0	155.20	0
07-12-2016	160.75	155.85	334	156.30	0	156.85	0
06-12-2016	156.90	159.65	270	160.30	0	161.00	0
05-12-2016	155.75	158.15	316	158.75	0	159.40	0
02-12-2016	155.45	154.15	309	155.20	1	155.30	0
01-12-2016	162.25	160.80	370	161.65	0	162.60	0

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