

CASE STUDY: IMPERFECT HEDGE

Ritu Sekhani , Sonali Varma

Universal Business School, Mumbai.



Introduction

In Arbitrage Theory, Hedging¹ Strategy is an approach to eliminate the total risk, also known as Perfect hedge. Perfect Hedge will not be perfect solution to portfolio as they are exposed to market risk that can't be controlled, therefore, financial firm and analysts opted for minimum loss strategy that is imperfectly hedged². A strategy where they hedge their share or portfolio in such a way that their client would suffer minimum loss instead of losing out on everything. The loss function will represent the performance of the market/company.

We will be looking at the market performance of COALINDIA³ of October 2021. A hedge that does not entirely eliminate market risk. Changes in the underlying position are not entirely reflected by changes in the hedge. This may be owing to timing issues or to the use of hedging instruments that are not entirely correlated to the underlying position.

¹ Hedging is a risk management strategy employed to offset losses in investments by taking an opposite position in a related asset. [https://indiafreemotes.com/perfect-imperfect-hedge/#:~:text=Following%20the%20example%20from%20the,a%20bit%20\(imperfect%20hedge\).&text=On%20November%201st%2C%20the%20spot,contract%20would%20be%20%2460.60%2Fbbl](https://indiafreemotes.com/perfect-imperfect-hedge/#:~:text=Following%20the%20example%20from%20the,a%20bit%20(imperfect%20hedge).&text=On%20November%201st%2C%20the%20spot,contract%20would%20be%20%2460.60%2Fbbl)

² Imperfect Hedge is when Hedger's gain and loss in spot and futures market are not fully offset. Taghi Ghadiri Abkenar, Risk Modelling in Liberalized Electricity Market, March 2017.

https://www.researchgate.net/publication/323187483_Risk_Modeling_in_the_Liberalized_Electricity_Market

³ Coal India Limited (CIL) is an Indian government-owned coal mining and refining corporation.

Global Market

September was a roiled month in terms of equity and Dow & Jones⁴ falling to 4.3%, S&P⁵ to 4.8%, NASDAQ⁶ to 5.3%, declaring it to be the worst month since March 2020 when pandemic hit the stock market.

Despite this, financial analysts globally were positive about October being the month of worst news shedding and autumn beginning.

Indian Market

The financial analysts after extensive research on national market, global market and macro-economic factors recommended the clients to buy the stocks of COALINDIA.

The analysis suggested that the stocks have a high probability to provide good return in the future with adequate risk.

The graph of COALINDIA went up in September and had a good probability to soar high in terms of returns.

In October, The Hindu⁷, states that India recorded a power supply shortage of 1,201 million units in October 2021, in past 5.5 years⁸. Due to crunch in coal stocks available with thermal plants.

Indian's dependence on coal-fired power increased to 69.6% IN OCTOBER FROM 66.5% in September⁹, it was due to shortage in wind and hydro energy.

Company

Coal India Is government owned coal mining and refining corporation. it is one of the largest coal-producing companies in the world. Around 82% of coal production is contributed from coal-India. it has produced 554.14 million tones in 2016-2017 which was earlier 494.24 million in 2014-15. That have also planted 1.57 million saplings during 2014-15 over the area of 33700. September 2st 2021 COALINDIA closes at 141.60.

Background

Captovest was started by Akash in 1999 and the company is based out of Hyderabad. He has worked as trader and lead strategies for 20 years and has formulated stock market strategies for many renowned companies

⁴ Dow Jones Industrial Average (DJIA), also known as the Dow 30, is a stock market index that tracks 30 large, publicly-owned blue-chip companies trading on the New York Stock Exchange (NYSE) and the Nasdaq.

⁵ S&P 500, abbreviation of Standard and Poor's 500, in the United States, a stock market index that tracks 500 publicly traded domestic companies.

Jesse Pound, Pippa Setvens, Dow drops 500 points on September's final day, S&P 500 suffers worst month since march 2020, <https://www.cnbc.com/2021/09/29/stock-market-futures-open-to-close-newshtml.html>, 29th Sep 2021.

⁶ National Association of Securities Dealers Automated Quotations - technically a dealer market where both buyers and sellers trade with a market maker.

⁷ The Hindu is an Indian newspaper that is owned by Hindu Group. It was established in 1878.

Mitali Mukherjee, A colder November for Indian's Stock Market, <https://thewire.in/economy/india-stock-market-november-fatigue>, Nov 2021.

⁸ Vignesh Radhakrishnan, October saw highest power shortage in over 5 years, <https://www.thehindu.com/news/national/october-2021-saw-highest-power-shortage-in-over-5-years/article37361732.ece>, Nov 2021.

⁹ The Times of India, is 3rd largest English Newspaper in India. it was founded in 1838. Reuters, India's October power shortage worst since march 2016. <https://timesofindia.indiatimes.com/business/india-business/indias-october-power-shortage-worst-since-march-2016/articleshow/87010296.cms>, Oct 2014.

and HNI's. He was motivated by the market and started his own firm in 1999, they started small and now they have client base of 500 (included HNI's, Private Equity Investors, Company and etc). Captovest has strong customer base as they have seen 2008 market crash, Company has recently reached manpower of 50 and their turnover is 50 Billion as on Dec 2021. Captovest offers various servicers like Portfolio Management, Asset Management, Real Estate Management and Hedge Fund Management.

Captovest has approval from SEBI¹⁰. It is also associated with National Stock Exchange¹¹ (NSE), The Bombay Stock Exchange¹² (BSE), The Multi-Commodity Exchange¹³ (MCX) and The National Commodity and derivative Exchange¹⁴.

Monika Overview on Market

As the market where down due to Covid-19 and trying to recover from it. Monika who worked as lead Research for Captovest. The clients where troubled looking at the markets performance. The research team were responsible to come up with a strategy that will help our clients generate positive returns. The team has been monitoring the nifty 50 index (Annexure 1) and after careful analysis for a week has recommend our clients to buy Coal India(Annexure 2) stocks.

Client Profile

A meeting was called with the financial strategists across the company to counsel on what can be advised to the clients who wish to hold the position in the market but want to generate positive returns?

All the portfolios were viewed with their positions and goals ahead.

The financial analysts suggested the clients to hold on their positions and asked to perform hedging.

The clients on the basis of their holding size were asked to hedge their positions. Client A,B,C were advised for perfect hedge whereas, client D wanted to square off¹⁵ his position before maturity, thus, he was advised to perform imperfect hedge¹⁶ on this position.

Purchases as per client name in spot.

Client Name	No. of shares Purchased
A	50
B	4000
C	8400

¹⁰ Securities and Exchange Board of India- plays an important role in regulating all the players operating in the Indian capital market.

¹¹ India's largest financial market has developed into a sophisticated, electronic market.

¹² Bombay Stock Exchange (BSE) is the first and largest securities market in India.

¹³ The Multi Commodity Exchange of India Limited (MCX), India's first listed exchange, is a state-of-the-art, commodity derivatives exchange that facilitates online trading of commodity derivatives transactions.

¹⁴ National Commodity & Derivatives Exchange Limited (NCDEX) (NCDEX/the Exchange) is a leading agricultural commodity exchange in India.

¹⁵ a trader buys or sells a particular quantity of an asset (mostly stocks) and later in the day reverses the transaction, in the hope of earning a profit.

¹⁶ A hedge that does not entirely eliminate market risk. Changes in the underlying position are not entirely reflected by changes in the hedge.

D	4200 (Before Maturity square-off)
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The shares were purchased on 1st October 2021 by all the clients at closing price¹⁷ of Rs. 188.70

Futures Market¹⁸ lot size¹⁹ was 4200,

Client Name	Shorting Date	Price
A	01-10-2021	189.65
B	05-10-2021	198.45
C	07-10-2021	191.60
D	07-10-2021	191.60

Since A,B,C were advised to hold the position until maturity and D wanted to square off before maturity.

Expiry of futures in October 2021 is as on 28-10-2021. Financial Analysts suggested that looking at the trends and graphs of COALINDIA, even if the stock goes down, the investors are bound to make profit as they have hedged their position in the market.

Simultaneously, if D decides to square off his position before maturity, he will still make profits due to him hedging (Imperfect Hedge) his position.

Conclusion

Client A makes profit when the prices go down and loss when prices go up. But the reverse is with client B & C where they make profits when the prices go up and loss when the prices go down. Client D makes loss if he squares off his position at maturity.

(Annexure 1) Nifty 50

Date	Open	Close
02-Aug-2021	15874.90	15885.15
03-Aug-2021	15951.55	16130.75
04-Aug-2021	16195.25	16258.80
05-Aug-2021	16288.95	16294.60

¹⁷ The closing price is the raw price or cash value of the last transacted price in a security before the market officially closes for normal trading.

¹⁸ Futures are exchange-traded derivatives contracts that lock in future delivery of a commodity or security at a price set today.

¹⁹ A lot in the financial markets is the number of units of a financial instrument bought on an exchange.

06-Aug-2021	16304.40	16238.20
09-Aug-2021	16281.35	16258.25
10-Aug-2021	16274.80	16280.10
11-Aug-2021	16327.30	16282.25
12-Aug-2021	16303.65	16364.40
13-Aug-2021	16385.70	16529.10
16-Aug-2021	16518.40	16563.05
17-Aug-2021	16545.25	16614.60
18-Aug-2021	16691.95	16568.85
20-Aug-2021	16382.50	16450.50
23-Aug-2021	16592.25	16496.45
24-Aug-2021	16561.40	16624.60
25-Aug-2021	16654.00	16634.65
26-Aug-2021	16627.95	16636.90
27-Aug-2021	16642.55	16705.20
30-Aug-2021	16775.85	16931.05
31-Aug-2021	16947.50	17132.20
01-Sep-2021	17185.60	17076.25
02-Sep-2021	17095.40	17234.15
03-Sep-2021	17262.45	17323.60
06-Sep-2021	17399.35	17377.80
07-Sep-2021	17401.55	17362.10
08-Sep-2021	17375.75	17353.50
09-Sep-2021	17312.85	17369.25
13-Sep-2021	17363.55	17355.30
14-Sep-2021	17420.35	17380.00
15-Sep-2021	17387.65	17519.45
16-Sep-2021	17539.20	17629.50
17-Sep-2021	17709.65	17585.15
20-Sep-2021	17443.85	17396.90
21-Sep-2021	17450.50	17562.00

22-Sep-2021	17580.90	17546.65
23-Sep-2021	17670.85	17822.95
24-Sep-2021	17897.45	17853.20
27-Sep-2021	17932.20	17855.10
28-Sep-2021	17906.45	17748.60
29-Sep-2021	17657.95	17711.30
30-Sep-2021	17718.90	17618.15
01-Oct-2021	17531.90	17532.05
04-Oct-2021	17615.55	17691.25
05-Oct-2021	17661.35	17822.30
06-Oct-2021	17861.50	17646.00
07-Oct-2021	17810.55	17790.35
08-Oct-2021	17886.85	17895.20

(Annexure 2) Coal India

Date	Open Price	Close Price
02-Aug-2021	144.30	143.90
03-Aug-2021	143.90	144.25
04-Aug-2021	144.15	144.70
05-Aug-2021	145.00	145.45
06-Aug-2021	145.60	146.10
09-Aug-2021	147.50	143.25
10-Aug-2021	143.70	142.20
11-Aug-2021	142.90	143.95
12-Aug-2021	144.05	144.40
13-Aug-2021	145.05	143.75
16-Aug-2021	143.80	142.00
17-Aug-2021	142.10	139.25
18-Aug-2021	139.25	138.35

20-Aug-2021	137.50	135.60
23-Aug-2021	136.30	133.95
24-Aug-2021	134.35	136.20
25-Aug-2021	136.50	138.85
26-Aug-2021	138.85	137.30
27-Aug-2021	137.90	138.55
30-Aug-2021	138.60	143.60
31-Aug-2021	143.60	145.85
01-Sep-2021	146.60	144.20
02-Sep-2021	143.80	141.60
03-Sep-2021	141.90	146.35
06-Sep-2021	147.80	146.35
07-Sep-2021	147.00	147.20
08-Sep-2021	147.35	149.15
09-Sep-2021	149.15	148.65
13-Sep-2021	149.60	154.60
14-Sep-2021	155.35	154.70
15-Sep-2021	155.50	161.05
16-Sep-2021	162.15	162.30
17-Sep-2021	162.70	156.70
20-Sep-2021	155.90	154.20
21-Sep-2021	155.70	156.40
22-Sep-2021	157.25	162.10
23-Sep-2021	163.75	167.35
24-Sep-2021	168.10	166.10
27-Sep-2021	167.00	167.05
28-Sep-2021	168.50	174.55
29-Sep-2021	174.50	185.70
30-Sep-2021	187.60	185.10
01-Oct-2021	185.40	188.70
04-Oct-2021	188.70	188.70

04-Oct-2021	192.50	189.95
05-Oct-2021	191.00	197.95
06-Oct-2021	200.00	192.85
07-Oct-2021	194.75	190.70
08-Oct-2021	191.10	188.45

Coal India (3 Months Chart)



TEACHING NOTES

From the graph and analysis, assuming that the prices of the stock:

Assuming the price would fall to 170.85

For Client A

At expiry:

Spot=Futures = 170.85

Short in spot (170.85*50)	8542.5
Long in futures (189.65-170.85)*4200	<u>78,960</u>
Total CF	87,502.5
No. of shares	<u>50</u>
Effective S.P	1750.05
-B.P	<u>188.70</u>
Profit	1561.35

Assuming the price would go up to 208.95

For Client A

At expiry:

Spot=Futures = 208.95

Short in spot (208.95*50)	10447.5
Long in futures (189.65-208.95)*4200	<u>-81,060</u>
Total CF	-70,612.5
No. of shares	<u>50</u>
Effective S.P	-1412.25
-B.P	<u>188.70</u>
Loss	-1223.55

From the graph and analysis, assuming that the prices of the stock:

Assuming the price would fall to 150.85

For Client B

At expiry:

Spot=Futures = 150.50

Short in spot (150.50*4000)	6,02,000
Long in futures (198.45-150.50)*4200	<u>2,01,390</u>
Total CF	4,00,610
No. of shares	<u>4000</u>
Effective S.P	100.15
-B.P	<u>188.70</u>
Loss	-88.55

Assuming the price would go up to 250.50

For Client B

At expiry:

Spot=Futures = 250.50

Short in spot (250.50*4000)	10,02,000
Long in futures (198.45-250.50)*4200	<u>-2,18,610</u>
Total CF	7,83,390
No. of shares	<u>4000</u>
Effective S.P	195.85
-B.P	<u>188.70</u>

Profit
7.15

From the graph and analysis, assuming that the prices of the stock:

Assuming the price would fall to 120.26

For Client C

At expiry:

Spot=Futures = 120.25

Short in spot (120.25*8400)	10,10,100
Long in futures (191.60-120.25)*4200	<u>2,99,670</u>
Total CF	7,10,430
No. of shares	<u>8400</u>
Effective S.P	84.575
-B.P	<u>188.70</u>
Loss	-104.125

Assuming the price would go up to 225.55

For Client C

At expiry:

Spot=Futures = 225.55

Short in spot (225.55*8400)	18,94,620
Long in futures (191.60-225.55)*4200	<u>-1,42,590</u>
Total CF	17,52,030
No. of shares	<u>8400</u>
Effective S.P	208.57
-B.P	<u>188.70</u>
Profit	19.87

From the graph and analysis, assuming that the prices of the stock:

Assuming the price would fall to 125.55

For Client D

At expiry:

Spot=Futures = 125.55

Short in spot (125.55*4200)	5,27,310
Long in futures (191.60-125.55)*4200	<u>2,77,410</u>
Total CF	2,49,900

No. of shares	<u>4200</u>
Effective S.P	59.5
-B.P	<u>188.70</u>
Loss	-129.2

Assuming the price would go up to 208.95

For Client D

At expiry:

Spot=Futures = 212.95

Short in spot (212.95*4200)	8,94,390
Long in futures (191.60-212.95)*4200	<u>-89,670</u>
Total CF	-8,04,720
No. of shares	<u>4200</u>
Effective S.P	-191.6
-B.P	<u>188.70</u>
Loss	-191.6
