
FUTURES CONTRACT ADVANCED STRATEGIES

HEDGING

Producers and manufacturers can make use of the futures market to hedge the price risk of commodities that they need to purchase or sell in order to protect their profit margins. Businesses employ a long hedge to lock in the price of a raw material that they wish to purchase sometime in the future. To lock a selling price for a product to be sold in the future, short hedge is used.

Hedging against falling Corn prices using Corn Futures

Corn producers can hedge against falling corn price by taking up a position in the corn futures market.

Corn producers can employ what is known as a short hedge to lock in a future selling price for an ongoing production of corn that is only ready for sale sometime in the future.

To implement the short hedge, corn producers sell enough corn futures contracts in the futures market to cover the quantity of corn to be produced.

Corn futures short hedge example

A corn grower has just entered into a contract to sell 5,000 tonnes of corn, to be delivered in 3 months' time. The sale price is agreed by both parties to be based on the market price of corn on the day of delivery. At the time of signing the agreement, spot price for corn is €173.25/ton while the price of corn futures for delivery in 3 months' time is €174.00/ton.

To lock in the selling price at €174.00/ton, the corn grower can enter a short position in an appropriate number of Euronext Corn futures contracts. With each Euronext Corn futures contract covering 50 tonnes of corn, the corn grower will be required to short 100 futures contracts.

The effect of putting in place the hedge should guarantee that the corn grower will be able to sell the 5,000 tonnes of corn at €174.00/ton for a total amount of €870,000. Let's see how this is achieved by looking at scenarios in which the price of corn makes significant moves either upwards or downwards by delivery date.

Scenario 1: Corn spot price fell by 10% to €155.90/ton on delivery date

As per sales contract, the corn grower will have to sell corn at only €155.90/ton, resulting in net sales proceeds of €779,500.

By delivery date, the corn futures price will have converged with the corn spot price and will be equal to €155.90/ton. As the short futures position was entered at €174.00/ton, it will have gained $€174.00 - €155.90 = €18.10$ per tonne. With 100 contracts covering a total of 5000 tonnes, the total gain from the short futures position is €90,500.

Together, the gain in the corn futures market and the amount realized from the sales contract will total $€90,500 + €779,500 = €870,000$. This amount is equivalent to selling 5,000 tonnes of corn at €174.00/ton.

Scenario 2: Corn spot price rose by 10% to €190.55/ton on delivery date

With the increase in corn price to €190.55/ton, the corn producer will be able to sell 5,000 tonnes of corn for higher net sale proceeds of €952,750.

However, as the short futures position was entered at a lower price of €174.00/ton, it will have lost $€190.55 - €174.00 = €16.55$ per tonne. With 100 contracts covering a total of 5,000 tonnes of corn, the total loss from the short futures position is €82,750.

In the end, the higher sales proceeds is offset by the loss in the corn futures market, resulting in a net proceeds of $€952,750 - €82,750 =$

€870,000. Again this is the same amount that would be received by selling 5,000 tonnes of corn at €174.00/ton.

Risk/Reward Tradeoff

As can be seen from the above examples, the downside of the short hedge is that the corn seller would have been better off without the hedge if the price of the commodity went up.

An alternative way of hedging against falling corn prices while still be able to benefit from a rise in corn price is to buy corn put options.

HEDGING AGAINST RISING GOLD PRICES USING GOLD FUTURES

Gold is a soft, dense, shiny and highly attractive bright yellow metal. Since thousands of years, gold has been used to fashion ornaments and jewelry. Gold is also the ultimate store of value. Buying gold as anti-inflation hedge is the primary use of gold today.

Businesses that need to buy significant quantities of gold can hedge against rising gold price by taking up a position in the gold futures market.

These companies can employ what is known as a long hedge to secure a purchase price for a supply of gold that they will require sometime in the future.

To implement the long hedge, enough gold futures are to be purchased to cover the quantity of gold required by the business operator.

Gold futures long hedge example

A goldsmith will need to produce 10,000 troy ounces of gold in 3 months' time. The prevailing spot price for gold is \$1,748.00/oz. while

the price of gold futures in 3 months' time is \$1,749.00/oz. To hedge against a rise in gold price, the goldsmith decided to lock in a future purchase price of \$1,749.00/oz by taking a long position in an appropriate number of CME gold futures contracts. With each CME Gold futures contract covering 100 troy ounces of gold, the goldsmith will be required to go long 100 futures contracts to implement the hedge.

The effect of putting in place the hedge should guarantee that the goldsmith will be able to purchase the 10,000 troy ounces of gold at \$1749/oz for a total amount of \$17,490,000.00. Let's see how this is achieved by looking at scenarios in which the price of gold makes a significant move either upwards or downwards by delivery date.

Scenario 1: Gold spot price rose by 10% to \$1,922.80/oz on Delivery Date.

With the increase in gold price to \$ 1,922.80, the goldsmith will have now to pay \$19,228,000.00 for the 10,000 troy ounces of gold. However, the increased purchase price will be offset by the gains in the futures market.

By delivery date, the gold futures price will have converged with the gold spot price and will be equal to \$1,922.80/oz. as the long futures position was entered at a lower price of 1,749.00/oz, it will have

gained $\$1,922.80 - \$1,749.00 = \$173.80$ per troy ounce. With 100 contracts covering a total of 10,000 troy ounces of gold, the total gain from the long futures is $\$1,738,000.00$.

In the end, the higher purchase price is offset by the gain in the gold futures market, resulting in a net payment amount of $\$19,228,000.00 - \$1,738,000.00 = \$17,490,000.00$. This amount is equivalent to the amount payable when buying the 10,000 troy ounces of gold at $\$1,749.00/\text{oz}$.

Scenario 2: Gold spot price fell by 10% to \$1,573.20/oz on delivery date.

With the spot price having fallen to $\$1,573.20$, the goldsmith will only need to pay $\$15,732,000.00$ for the gold. However, the loss in the futures market will offset any saving made.

Again, by delivery date, the gold futures price will have converged with the gold spot price and will be equal to $\$1,573.20/\text{oz}$. As the long futures position was entered at $\$1,749.00/\text{oz}$, it will have a loss of $\$1,749.00 - \$1,573.20 = \$175.80$ per troy ounce. With 100 contracts covering a total of 10,000 troy ounces, the total loss from the long futures position is $\$1,758,000.00$.

Ultimately, the savings realized from the reduced purchase price for the commodity will be offset by the loss in the gold futures market and the net amount payable will be $\$15,732,000.00 + \$1,758,000.00 = \$17,490,000.00$. Once again, this amount is equivalent to buying 10,000 troy ounces of gold at $\$1,749.00/\text{oz}$.

Risk/Reward Tradeoff

As you can see from the above examples, the downside of the long hedge is that the gold buyer would have been better off without the hedge if the price of commodity fell.

An alternative way of hedging against rising gold prices while still be able to benefit from a fall in gold price is to buy gold call options.

HEDGING A STOCK PORTFOLIO

Scenario

A portfolio manager has a €100,000 portfolio that is perfectly representative of euro-zone equity markets. In November, he seeks to hedge the portfolio against a stock market decline. The manager has calculated his portfolio beta relative to the Dow Jones Eurostoxx50 index as 1. The most appropriate means of achieving his hedging objective is consequently to use the futures contract on the Dow Jones Eurostoxx50 index.

The Dow Jones eurostoxx50 index stands at 2096 and the December expiry of the related futures contract is trading at 2125 (the December expiry will close at 12:00 noon on the third Friday of the month).

Strategy

The manager will seek to offset any losses on his portfolio due to a market decline with equivalent gains on futures contract. To do this, he will have to take a futures position on the opposite side of his position with the portfolio: in other words, he will have to sell futures contracts. He now has to determine how many contracts are needed to hedge his portfolio. This number depends on the amount to be hedged, the level

of the index and the composition of the portfolio as captured by its beta relative to index.

Here, the number of contracts to be sold is obtained by dividing the value of the portfolio to be hedged by the nominal value of the contract (level of index X contract multiplier), since the beta of the portfolio is unity.

$$\text{Nb of contracts to be sold} = \frac{€100,000}{2096 \times 10} = 4.77$$

Sell 5 December expiry futures contracts on the Dow Jones Eurostoxx50 at 2125

Results

Five week later, the Dow Jones Eurostoxx50 index is at 1 991.20 (- 5%) and the future is trading at 2191. The portfolio manager thus has reason to close out his position.

Buy 5 December expiry futures contract on the Dow Jones Eurostoxx50
at 2019

Loss on the portfolio:	- €5 000 ($€100\,000 \times -5\%$)
Gain on the futures:	+ €5 300 ($((2125 - 2019) \times 5 \text{ (nb of contracts)}) \times 10€$)
Net gain:	+€ 300

Selling 5 futures contracts has thus enabled the manager to hedge his portfolio of European equities in a single transaction, quickly, easily and at low cost.

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