W|C|H

Refiner Hedging a Narrowing Price Differential between Heavy Crude Oil and Light Crude Oil

A refiner's processing margins are gradually being squeezed as a warm winter has sharply reduced the demand for heating oil. The refiner expects margins to shrink further from current levels as OPEC and Canadian producers cut output of heavy crude oil, as global demand slows, tightening supply and narrowing the price discount of heavy crude oil relative to light crude oil.

Refiners buy crude oil as the raw material for their operations to produce and sell refined products—typically, heating oil and gasoline. So, refiners make money from the differential between different grades of crude oil (light and heavy) and prices of refined products, not the price of crude oil and gasoline alone.

Since Canadian crude oil is priced at a differential to WTI, the refiner is exposed to the risk of large fluctuations in the price differential between heavy crude oil and light crude oil. Specifically, a narrowing price differential between heavy crude oil and light crude oil implies that it costs the refiner more to produce heating oil by refining heavy crude oil, thereby cutting into profitability.

Consequently, the refiner seeks to lock-in the price differential between heavy crude oil and light crude oil to hedge against the risk that the price differential will narrow between the time the price is agreed upon with the producer and the time the heavy crude oil will be delivered in four weeks. To hedge the risk against further erosion in processing margins, the refiner decides to adopt a strategy using Canadian Heavy Crude Oil Differential Price futures (or WCH DIFF futures).

Backdrop Scenario

	TODAY	IN FOUR WEEKS
Price of the WTI futures	US$80.00	US$70.00
WCS WTI differential price (the NGX WCS WTI Crude Oil Index represents the price differential between WCS and WTI)	-US$12.00 Note: WCS is priced US$12.00 per barrel lower than WTI.	-US$5.00 Note: WCS is priced US$5.00 per barrel lower than WTI.
Implied price of one barrel of WCS	US$68.00	US$65.00

Strategy

ACTION	TODAY	IN FOUR WEEKS	REMARKS
Step 1 – Hedge the price of one barrel of WCS	Buy WTI futures @ US$80.00	Sell WTI futures @ US$70.00	Refiner closes out the position in WTI futures. Note: there is no delivery of WTI crude oil as the position is closed before the expiration of the WTI futures. **Loss = -US10.00**
Implied price of one barrel of WCS (change in the price of heavy crude oil over the time period)	US$68.00	US$65.00	It costs the refiner US$3.00 less (per barrel) to buy WCS heavy crude oil. **Profit = +US$3.00**

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ACTION	TODAY	IN THREE WEEKS	REMARKS
Step 2 – Hedge the basis risk between heavy crude oil and light crude oil Refiner buys WCH DIFF futures @ -US$12.00 or US$88.00 as per the quotation method of 100 + the NGX WCS WTI Crude Oil Index for the WCH futures contract Note: the NGX WCS WTI Crude Oil Index is the underlying index for the WCH DIFF futures.	Buy WCH DIFF futures @ US$88.00	Sell WCH DIFF futures @ US$95.00	Refiner closes out the position in WCH DIFF futures. Note: The refiner buys WCH DIFF futures to hedge the basis risk between heavy crude oil (WCS) and light crude oil (WTI). **Profit = +US$7.00**
Net profit/loss			**Net profit/loss = US$0.00** (resulting in a fully hedged position)

Therefore, the refiner's strategy to buy the WTI futures contract (to hedge the price of one barrel of WCS) combined with a long position in the WCH DIFF futures contract to hedge the basis risk (specifically, to hedge against a narrowing of the price differential between one barrel of WTI and one barrel of WCS) results in a efficiently hedged position.

Had the refiner not used the WCH DIFF futures contract, he would have suffered a loss of US$7.00 per barrel. The refiner can hedge the basis risk using WCH DIFF futures contracts.

In this scenario, regardless whether the price of WTI or WCS rises or drops, the refiner's motivation for initiating the transaction is to hedge against the risk of a narrowing of the price differential between WTI and WCS.