



# Introduction to Commodity Futures Markets

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# Commodity Futures Markets

## What are futures?

- A futures contract is a legally binding agreement to buy or sell a commodity or financial instrument sometime in the future at a price agreed upon at the time of the trade.

## Function of Futures

- Risk Transfer
  - Hedger wishes to transfer risk
  - Investor/speculator accept risk
- Allocation of storage, supply across time
- Price Discovery
- Investment Medium



The markets are largely speculators who provide the liquidity needed to trade in markets. Hedgers are those who have a cash position with which they wish to transfer the risk of price loss if they wish to sell the cash commodity in the future or to transfer the risk of price gain if they wish to buy the cash commodity in the future.

Futures markets provide a way of allocating storage and supply of commodities across time and places.

Futures markets provide price discovery of what hedgers are willing to either sell (or buy) their cash commodity at.

Futures markets provide an investment medium because they are highly leveraged. Margins required for purchase (selling) futures are a small percentage of the total value of the contract. Trading stocks require you to deposit the entire contract amount in order to buy. 1 contract of corn is 5000 bushels. At the price \$3.78/bu, to buy 1 contract without margins a buyer would have to spend \$18,900 to purchase the contract. However, with margins the speculator only has to spend \$1500/contract to buy 1 corn contract.

## **Futures can be bought (long) or sold (short).**

### **LONG**

- The purchase (buy) of a futures contract.
- Profits from an upward movement in the market.
- Goal is to buy low and sell at a higher price.
- Offset with a short position

### **SHORT**

- Selling of a futures contract.
- Profits from a downward movement in the market.
- Goal is to sell high and buy back at a lower price
- You do not have to own the commodity to sell futures.
- Offset with long position.

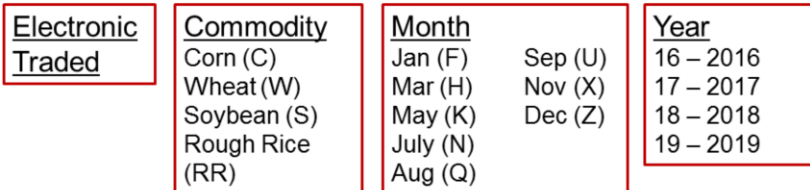
Producer (hedger) goes long 1 ZCZ contract at \$3.78 – this means that the producer bought a December corn contract at \$3.78/bu. In order to profit, the producer would need to sell the contract above \$3.78/bu + exchange fees and commission.

# Futures Contract

Top Agricultural Futures Contracts:

- Corn, Soybean, Wheat, Rough Rice

ZCZ16



# Futures Contract

## Contract Specifications

Symbol	ZC
Name	Corn (ZC)
Exchange	CBOT
Trading Months	March, May, July, September, December (H, K, N, U, Z)
Contract Size	5,000 bushels
Tick Size	1/4 cent per bushel (\$12.50 per contract)
Daily Limit	35 cents per bushel (\$1,750 per contract) Expanded limit 55 cents
Trading Hours	7:00p.m. - 7:45a.m. and 8:30a.m. - 1:20p.m. (Sun-Fri) CST
Last Trading Day	The business day prior to the 15th calendar day of the contract month
Value of One Futures Unit	\$50
Value of One Options Unit	\$50

Each commodity is given a symbol for trading. Corn's electronic trading symbol is ZC. The "Z" symbolizes an electronic contract instead of a pit traded contract. To indicate the month for the future being traded a letter is added to the end of the contract. For instance, December corn would be written as ZCZ16, July corn would be written as ZCN16. 16 denotes the year, 2016. Each contract of corn is for 5000 bushels.

Contracts change on the market a tick at a time. For corn, each tick represents ¼ cent per bushel (\$12.50 per contract). Daily limits are established as to limit the losses (gains) a market can reach within the trading hours. For corn this is 35 cents per bushel (\$1750 per contract).

Corn trades March, May, July, September, December (H, K, N, U, Z)

Soybean trades January, March, May, July, August, September, November (F, H, K, N, Q, U, X)

Rice trades January, March, May, July, September, November (F, H, K, N, U, X)

Wheat trades March, May, July, September, December (H, K, N, U, Z)

## Futures Contract

Futures prices are traded in ticks.

- A tick is the minimum price fluctuation for a futures contract.
- Ticks vary by commodity contract. For corn the minimum tick is  $0\frac{1}{2}$  or  $\frac{1}{4}$ <sup>th</sup> of a cent.
- For example ZCZ16 is  $36\frac{1}{2}$  on the market. This represents a price of \$3.6125.
- The value of a single tick in corn is \$12.50/contract.
- ZCZ16  $36\frac{1}{2}$  total contract value = \$18,050
  - ( $\$3.61/\text{bu} * 5000\text{bu} = \$18,050$ )
- ZCZ16  $36\frac{1}{4}$  total contract value = \$18,062.50
  - ( $\$3.6125/\text{bu} * 5000\text{bu} = \$18,062.50$ )
- ZCZ16  $37\frac{3}{4}$  total contract value = \$18,937.50
  - ( $\$3.7875/\text{bu} * 5000\text{bu} = \$18,937.50$ )

Most grains have similar tick sizes.

## Futures Contract

Contract	Last	Net Change	Bid	Ask
ZCU14	361 <sup>0</sup> ( 1 )	3 <sup>0</sup>	361 <sup>0</sup> ( 97 )	361 <sup>2</sup> ( 215 )
ZCZ14	372 <sup>4</sup> ( 1 )	2 <sup>6</sup>	372 <sup>4</sup> ( 262 )	372 <sup>6</sup> ( 92 )
ZCH15	385 <sup>6</sup> ( 1 )	2 <sup>6</sup>	385 <sup>6</sup> ( 3 )	386 <sup>0</sup> ( 200 )
ZCK15	394 <sup>2</sup> ( 1 )	2 <sup>6</sup>	394 <sup>0</sup> ( 158 )	394 <sup>4</sup> ( 330 )
ZCN15	401 <sup>0</sup> ( 1 )	2 <sup>6</sup>	400 <sup>6</sup> ( 311 )	401 <sup>2</sup> ( 162 )
ZCU15	407 <sup>4</sup> ( 1 )	3 <sup>4</sup>	407 <sup>0</sup> ( 22 )	407 <sup>4</sup> ( 1 )
ZCZ15	413 <sup>6</sup> ( 1 )	3 <sup>4</sup>	413 <sup>4</sup> ( 11 )	413 <sup>6</sup> ( 35 )

Each futures contract has a bid and an ask. The bid is price at which a trader will buy the contract. For example, ZCU14 has a bid of \$3.61<sup>0</sup>. There are 91 trades to buy at \$3.61. On the other hand, the ask is the price at which a trader is willing to sell. For ZCU14, there are 215 trades offered for sale at \$3.61<sup>2</sup>. Until the bid/ask prices converge, no trade is made.

# Futures Margin

## What is margin?

- Margin is a performance bond or deposit put up by both the buyer and seller of a futures contract.
- Typically margin is 5-10% of the value of the contract, yet the purchaser of the contract is liable for the full contract value.
- Initial margin is the margin required at the time of purchasing the futures contract. The owner of the futures contract must then keep a specified amount (maintenance margin) in the account at all times.
- Initial margins required are higher for speculators than for hedgers as speculation has more risk involved.

For corn, the maintenance margin is \$1000. The initial margin is \$1100. Again the producer (hedger) purchased 1 ZCZ contract at \$3.78/bu. The entire contract value is \$18,900 ( $\$3.78/\text{bu} * 5000\text{bu}$ ). The producer is not required to have the full amount to purchase the contract, but instead pays the initial margin, \$1100, and becomes liable for the entire contract value, \$18,900. The producer must keep \$1000 (maintenance margin) in the account at all times.



## Futures Margin Example

January 14 2016: A hedger decides to open an account and deposits \$3000 to use for trading. The hedger wishes to sell 2 contracts of December corn at \$3.78/bu. The broker then places the order for the hedger and the order is filled at \$3.78.

The hedger is now SHORT 2 ZCZ16 contracts at \$3.78. The initial margin required is \$1100/contract = \$2200. The available balance in the hedger's account is now \$800 (\$3000 original deposit - \$2200 margin = \$800)

January 15 2016: During the day the market traded upward and closed at \$3.90/bu. This would cause the hedger to lose \$0.12/bu. This loss amounts to \$600/contract (\$0.12/bu\*5000bu).

Note: This example does not include any fees or commissions associated with trading futures.

## Futures Margin Example

January 15 2016 cont.: The account available balance was \$800 at the start of the day. After a loss of \$1200 during the day, the ending available balance would be (\$-200). A margin call is then made for the account to have \$200 deposited. \*\*

January 16 2016: During the day the market traded downward and closed at \$3.75/bu. This would cause the hedger to gain \$0.15/bu. This gain amounts to \$750/contract ( $\$0.15/\text{bu} \times 5000\text{bu}$ ).

The hedger's account would be adjusted for both contracts. (\$1500 total)

The total balance in the account would be \$3500 with \$1500 available for use. ( $\$3500 - \$2000$  for margins)

\*\*After the initial maintenance is deposited the account must only be brought back to the maintenance margin. In this case, the initial margin was \$2200 (\$1100/contract). The maintenance margin was \$2000 (\$1000/contract). The margin call required was \$200, if this is not paid in a timely manner the account will be offset.

## Futures Margin Example

Account 123456				
Date	Transaction	Margin	Market Change	Balance Available
1/14/2016	Deposit \$3000			\$3,000
1/14/2016	Sell 2 ZCZ16 at \$3.78	\$2,200		\$800
1/15/2016	Corn settles at \$3.90	\$2,000	(+) \$0.12/bu	(-) \$200
1/15/2016	Margin Call for \$200			
1/16/2016	Deposit \$200	\$2,000		\$0
1/16/2016	Corn settles at \$3.75	\$2,000	(-) \$0.15/bu	\$1,500

**\*\*Note:** This does not include any fees or commissions which are associated with trading futures.



1/14/16: \$3000 - \$2200 for margin = \$800

1/15/16: \$3000 - \$2000 for margin – \$1200(\$0.12/bu \* 5000bu \* 2 contracts) = (-)\$200

**\*\*you subtract the market gain because this is a loss for a short position.**

1/16/16: Deposit \$200 to bring account back to \$2000 total (\$0 available)

1/16/16: \$2000 - \$2000 for margin + \$1500(\$0.15/bu\*5000bu\*2contracts) = \$1500

The total account balance on 1/16/16 is \$3500 which is \$500 more than the original deposit of \$3000. \$3500 - \$3000 = \$500 - \$200 deposit on 1/16/16 = \$300 total gain

This can be double checked by using the futures prices.

Sold at \$3.78/bu – market is now at \$3.75/bu = Gain of \$0.03/bu per contract.

\$0.03/bu\*5000/contract\*2contracts = \$300 total gain

## **Volume**

- Each unit of volume is equal to a trade being made
- 1 buy + 1 sell = 1 in volume measures
- The total number of long or short positions.

## **Open Interest**

- The number of position that exist or are “open”
- Have not been closed out by an offsetting transaction or delivery
- These positions remain open at end of day settlement

Volume and open interest are reported daily and are used by traders to determine the participation in a market and validity of price movement

If a market moves higher on low volume, this could be an important price movement. However, if the same price movement occurs with high volume, this would indicate an important trend may be emerging. If a contract experiences relatively low volume levels but high open interest, it is generally assumed that commercial participation is high. This is because commercial hedgers tend to use the markets for longer-term hedging purposes, putting their trades in and keeping them until they're no longer needed to manage a given price risk. Conversely, high volume with low open interest may indicate more speculative market activity. This is because the majority of speculators prefer to get in and out of the market on a daily basis.

## Position and Price Limits

- A position limit is the maximum number of contracts that may be held by a single market participant.
- Price limits, also called daily trading limits, specify a maximum price range allowed each day for a contract.
- Position limits mainly apply to speculators, but hedgers must back up position amount with physical commodity held or needed.
- Price limits are set by the exchange as a means of restricting price movements.
- While trading can occur at the limit, whenever the market price goes beyond the limit, trading ceases.

## Settlement and Delivery

- Offset – take an opposite position in the same commodity and month; before expiration
- Delivery or Cash Settlement – must accept delivery of physical commodity or settle by cash; at expiration
- Exchange for Physicals (EFP) – buyer and seller exchange physical commodities then notify exchange that positions have been cancelled.
- Deliver point – the point where the cash and futures market are physically connected; provides hedge effectiveness
- Delivery Value – cash price adjusted for transportation costs from delivery point to local market

Every futures contract must either be offset or delivered to be settled on or before contract expiration. If a producer is short 2 corn, in order to offset the position the producer must go long 2 corn before expiration or be at risk of being required to deliver the 2 contracts. For instance a producer who is short 2 ZCZ16 (December 2016 corn) must offset the contracts before December 14, 2016.

## **Basis = Cash - Futures**

- Basis is the difference between cash and futures prices.
- Typically, basis at delivery points are positive.
- An area that is deficit a commodity tends to be positive.
- Typically, basis in an area of surplus production tends to be negative.
- The two main determinants of basis is the distance from Chicago and local supply/demand.
- Grade and Quality can have basis implications (premiums or discounts to cash price)
- Zero = par
- Positive = premium
- Negative = discount

Basis tends to weaken around harvest.

Basis tends to strengthen after harvest.

Basis tends to be consistent even as prices fluctuate.

Basis is influenced by Transportation costs, local supply and demand conditions, interest and storage costs, and handling costs and profit margins.

Corn:

Local cash price is \$3.00

DEC futures is \$3.25

Basis is 25 under DEC

-\$0.25/bu

Soybean:

Local cash price is \$12.00

NOV futures is \$11.50

Basis is 50 over NOV

+\$0.50/bu

## **Basis = Cash - Futures**

Example 1:

Corn local cash price is \$3/bu on November 1<sup>st</sup>

Corn December futures are \$3.25/bu on November 1<sup>st</sup>

Basis is 25 under December OR (-)\$0.25/bu

Example 2:

Soybean local cash price is \$10/bu on November 1<sup>st</sup>

Soybean November futures are \$9.50/bu on November 1<sup>st</sup>

Basis is 50 over November OR (+)\$0.50/bu

Basis change refers to a change in the price relationship between the cash and futures markets. Basis does not refer to a change in price direction.

For a producer basis is used to determine the best time to buy or sell.



## 3 Main Types of Orders

- 1) Market Order – Order is filled at market price
  - State the number of contracts to buy or sell, price does not need to be specified. The order is executed ASAP
- 2) Limit Order – Order is filled at specified price or better
  - Specifies a price limit at which the order must be filled. You know the worst price you will receive for order; however the order may not be filled in a timely manner.
- 3) Stop Order – Order is filled as a market order once a specified price is reached
  - Not executed until the market reaches a given price; once the price is reached, the order becomes a market order

In order to “purchase” a futures contract, an order must be placed with a broker. There are 3 main types of orders.

Stop orders are most often used as a protective measure for gains or limiting losses. Many times a stop order is placed at a predetermined level so that if the market moves against a trader’s position it will automatically liquidate the position and limit future losses. This is especially useful considering commodity markets trade Sunday – Friday 7pm - 7:45am CT and Monday – Friday 8:30am – 1:20pm CT.

## Order Duration

- Most orders are day order and work only during that trading session, expiring at the end of the day.
- Open order, or good 'til canceled (GTC) orders, are worked until the contract expires or the customer cancels the order.
- Fill or kill orders are placed and immediately canceled if they do not fill.
- Market on close orders place a market order at the close of the trading day.

## Types of Traders

- There are two main classifications of traders: hedgers and speculators. Beyond the two main classifications, there are also scalpers, day traders, and position traders
- Hedgers are those who use the futures market to manage price risk. i.e., farmers, ranchers, food processors
- Speculators are those who use the futures market for the motive of profit. i.e., hedge funds
- Scalper trades in and out of the market many times a day trying to make a small profit on large volume trades
- Day trader is similar to a scalper but holds positions longer and makes fewer transactions. They make trades based on a prediction on the future direction of the market.
- Position trader is focused on long-term trends and market forces and tends to hold a position for a lengthy period.

For more on hedging and how to determine the distinctions between speculation and hedging, see the row-crop producers hedging guide or the livestock operators hedging guide.

# Key Terminology

- **Futures Market:** the centralized market place where buyers and sellers determine pricing of commodity and financial futures. Mostly electronic trading.
- **Cash Market:** the physical or primary market. Cash markets are where an actual exchange of physical product and payment occurs. Includes elevators and livestock auctions.
- **Bid:** represents the price at which there is a demand to buy a specific commodity at.
- **Ask (Offer):** the price at which there is a willing seller. Until the bid and ask price meet, a transaction does not occur.
- **Bid/Ask Spread:** the difference between the price at which demand is willing to buy at and supply is willing to sell at. A large spread infers a large price difference between supply and demand.

## Key Terminology

- **Long:** A long futures position represents an initial buy on the market with an obligation to accept delivery of the commodity purchased.
- **Short:** A short futures position represents an initial sell on the market with an obligation to make delivery of the commodity sold.
- **Offset:** When trading futures - if initially long, sell the same futures commodity as bought. (i.e. Long 10 DEC Corn contracts, to offset would Short 10 DEC Corn). If initially short, buy the same futures commodity. \*Must be same futures month and number of contracts
- **Bearish:** Expecting a decline in the market price. Used to describe the direction in which a trader expects the market to be moving.

## Key Terminology

- **Bullish:** Expecting an increase in the market price. Used to describe the direction in which the trader expects the market to be moving.
- **Volume:** The number of futures contracts that are traded typically within the day.
- **Open Interest:** The number of futures contracts that have traded, but have not been closed out either through offset or delivery. Can be viewed as the liquidity of a market.

## Sources

CME Group



Questions?  
Comments?

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