

AN OUTLINE INTRODUCTION TO FUTURES AND HEDGING

The following outline provides definitions and examples that are basic for the understanding of futures markets and hedging. What is a futures contract? What commodities are traded and where? What economic functions do futures markets serve? How are prices quoted? What is hedging and how is it accomplished? These questions are addressed in a brief way in this paper. The material is designed to be presented in conjunction with a lecture.

A Futures Contract

Definition: A futures contract is a legally binding commitment to deliver or take delivery of a given quantity and quality of a commodity, at a price agreed upon when the contract is made with delivery at the seller's option sometime during the specified future delivery month.

Terms and Rules:

1. Basic grade, discounts or premiums for other grades.
2. Delivery times.
3. Delivery points, inspection procedures.
4. Minimum price fluctuation.
5. Daily price limits.
6. Position limits for one trader.

Frequency of delivery: Less than 1-2% of contracts traded involve delivery.

Major Commodities and U.S. Futures Exchanges

| | |
|-------------------------|--------|
| Imp. lean beef | NYME |
| Broilers | CBT |
| Cattle (live) | CME |
| Cattle (feeder) | CME |
| Cattle | Mid Am |
| Citrus | NY CTN |
| Cocoa | CS&C |
| Coffee "C" | CS&C |
| Commercial paper (90 D) | CBT |
| Copper | Comex |
| Corn | CBT |
| Corn | Mid Am |
| Cotton | NY CTN |

| | |
|-----------------------|--|
| Currency | IMM |
| British Pound | |
| Cdn Dollar | |
| Deutschemark | |
| Japanese Yen | |
| Mexican Peso | |
| Swiss Franc | |
| Eggs | CME |
| Gold | CBT |
| Gold | Comex |
| Gold | IMM |
| Gold | Mid Am |
| GNMA (CD) | ACE |
| GNMA (CDR) | CBT |
| GNMA (CD) | CBT |
| Hogs (live) | CME |
| Hogs | Mid Am |
| Lumber | CME |
| Oats | CBT |
| #2 heating oil | NYME |
| Palladium | NYME |
| Platinum | NYME |
| Plywood | CBT |
| Pork bellies | CME |
| Potatoes (rd., white) | NYME |
| Silver | Comex |
| Silver | CBT |
| Silver | Mid Am |
| Soybeans | CBT |
| Soybeans | Mid Am |
| Soybean meal | CBT |
| Soybean oil | CBT |
| Sugar #11 | CS&C |
| Sugar #12 | CS&C |
| T-bills (90 D) | IMM |
| T-bills (1 year) | IMM |
| T-bonds | CBT |
| T-note (4 yrs.) | IMM |
| T-note (4-6 yrs.) | CBT |
| Wheat | CBT |
| Wheat | KC |
| Wheat | Mpls |
| Wheat | Mid Am |
| CBT | - Chicago Board of Trade |
| CME | - Chicago Mercantile Exchange |
| IMM | - International Monetary Market of the CME |
| Comex | - Commodity Exchange, Inc., New York |
| CS&C | - Coffee, Sugar & Cocoa Exchange |
| KC | - Kansas City Board of Trade |
| Mpls | - Minneapolis Grain Exchange |
| NYME | - New York Mercantile Exchange |
| ACE | - American Commodity Exchange |
| Mid Am | - Mid America Commodity Exchange |
| NY CTN | - New York Cotton Exchange |

Economic Functions of Futures Markets

1. Transfer risk, allow pricing in advance:
 - a. Speculators;
 - b. Hedgers.
2. Price discovery.
3. Information collection and dissemination.
4. Coordination of economic activity. Reduces cost of marketing.
5. Market stabilization.
6. Flexibility in pricing products and inputs.

Futures Prices on Soybeans
Chicago Board of Trade
Thursday, March 15, 1979

Soybeans (CBT) - 5000 bu.; cents per bu.

| | Open | High | Low | Settle | Change | Lifetime | | Open Interest |
|--------|------|------|------|--------|--------|----------|------|---------------|
| | | | | | | High | Low | |
| Mar | 735½ | 744½ | 735½ | 742 | +9 | 778½ | 577 | 2,055 |
| May | 750 | 758 | 749 | 754½ | +6½ | 797 | 606 | 48,921 |
| July | 758 | 766½ | 758 | 763½ | +6½ | 805½ | 607 | 31,756 |
| Aug | 753 | 758 | 751½ | 756½ | +6½ | 793 | 608 | 7,087 |
| Sept | 720 | 724½ | 720 | 721 | +4 | 743 | 648 | 3,220 |
| Nov | 703 | 705 | 701 | 704 | +3½ | 718 | 638½ | 25,291 |
| Jan 80 | 711½ | 714 | 710½ | 713½ | +5 | 727 | 655 | 6,832 |
| Mar | 721½ | 725 | 720½ | 724½ | +5½ | 738 | 686½ | 2,561 |

Est. vol. 27,361; vol. Wed. 37,304; open int. 127,723, - 1051

Cash price of soybeans at Chicago for No. 1 yellow = 734½ cents per bu.

Definitions of Terms Used in Futures Market Quotations

| | |
|-----------------------|--|
| Open | Prices recorded during the time of day designated by the exchange as the beginning of trading. |
| High | Highest price recorded during the period of trading. |
| Low | Lowest price recorded during the period of trading. |
| Settle | Single price designed as the official closing price at the end of the trading day. The "close" or closing prices sometimes involve a range of prices. |
| Lifetime High, Low | High and low prices during the period of time a particular contract month has been traded. |
| Open Interest | Unliquidated purchases <u>or</u> sales, not their combined total, usually quoted in terms of contracts, but sometimes in terms of bushels or other measures of quantity. |
| Volume | Number of purchases <u>or</u> sales, not the combined total. |

Hedging

Definition: Taking an opposite position in the futures market as in the cash market, concurrently.

Types:

1. Pricing a product:
 - a. Storable;
 - b. Non-storable or in process.
2. Pricing an input:
 - a. Storable;
 - b. Non-storable or in process.

Basis

Definition: "Basis" is the difference between some specified cash market price and some specified futures contract.

Importance: The key to effective hedging is that the "basis" is reasonably predictable as delivery time approaches. Basis risk is small relative to the risk in the level of price. "Arbitrage" tends to keep basis risk small.

Causes of Variation in Basis:

1. Changes in transportation costs.
2. Changes in storage costs.
3. Quality differences.
4. Special events--strikes, floods, embargoes, etc.
5. Market fundamentals--supply, demand.
6. Technical factors.

Storage Basis Patterns

1. Tendency to narrow.
2. Irregular, not linear.
3. Small or negligible, at delivery, plus transportation.
4. Variation much less than for level of price.

Pricing a Storable Product Example on Corn

Situation: Corn is to be stored under a hedge from harvest (Nov. 15) to June 15, using July futures. Basis is 70¢ per bushel on November 15 and is normally 40¢ on June 15. Storage cost is 14¢ and brokerage cost is 2¢ per bushel.

Case 1. Perfect Hedge, Prices Decline

| Date | | Cash | Futures | Basis |
|-------|----------------------|------------|-----------------------|-----------------|
| | | ¢/bu | ¢/bu | ¢/bu |
| 11/15 | Store | 200 | | |
| 6/15 | Sell | <u>185</u> | Sell July Buy July | 70 <u>40</u> |
| | Gain (+) or loss (-) | -15 | +45 | +30 |
| | Storage costs | <u>-14</u> | | -14 |
| | Net from cash market | -29 | | |
| | Brokerage | | - 2 | - 2 |
| | Net from futures | <u>+43</u> | <u>+43</u> | |
| | Net from hedge | <u>+14</u> | | <u>+14</u> |
| | Net price received | 214 | | |
| | Net price expected | 214 | | |

Case 2. Perfect Hedge, Prices Rise

| Date | | Cash | Futures | Basis |
|-------|----------------------|------------|-----------------------|-----------------|
| | | ¢/bu | ¢/bu | ¢/bu |
| 11/15 | Store | 200 | | |
| 6/15 | Sell | <u>250</u> | Sell July Buy July | 70 <u>40</u> |
| | Gain (+) or loss (-) | +50 | -20 | +30 |
| | Storage costs | <u>-14</u> | | -14 |
| | Net from cash market | 36 | | |
| | Brokerage | | - 2 | - 2 |
| | Net from futures | <u>-22</u> | <u>-22</u> | |
| | Net from hedge | <u>+14</u> | | <u>+14</u> |
| | Net price received | 214 | | |
| | Net price expected | 214 | | |

Case 3. Imperfect Hedge, Prices Decline

| Date | | Cash | Futures | Basis |
|-------|----------------------|------------|-----------------------|-----------------|
| | | ¢/bu | ¢/bu | ¢/bu |
| 11/15 | Store | 200 | | |
| 6/15 | Sell | <u>185</u> | Sell July Buy July | 70 <u>44</u> |
| | Gain (+) or loss (-) | -15 | +41 | +26 |
| | Storage costs | <u>-14</u> | | -14 |
| | Net from cash market | -29 | | |
| | Brokerage | | - 2 | - 2 |
| | Net from futures | <u>+39</u> | <u>+39</u> | |
| | Net from hedge | <u>+10</u> | | <u>+10</u> |
| | Net price received | 210 | | |
| | Net price expected | 214 | | |