Risks Associated With Marketing

November, 2013

Federal Reserve Bank of Chicago
Market Risk (Price Risk) is Always Present

Two Components

- Futures Price Risk

- Basis Risk (Cash price relative to futures price) caused by
  - Storage costs
  - Transportation costs
  - Handling costs and processing margins
  - Quality
  - Local Supply and Demand

Solution

- Use the best risk management tool to manage the uncertainty of cash (physical) market transactions.

Tools – Futures, Options, Swaps & Cash Market Contracts
Grain & Oilseeds prices have been highly volatile
Livestock prices have also been volatile.
• Historical volatility is calculated as the annualized standard deviation of daily price returns for the nearby futures contract.
• During the past 7 years, annualized historical volatility for corn, wheat and soybeans averaged about 30%, meaning that futures prices at any point in time for these commodities are expected to range +/-30% over the coming year.
• Grain & Oilseeds prices show relatively high volatility (30%), compared to equity indexes (20%) and U.S. Treasury Bond futures (10%).
Lean hog prices are also highly volatile, with significantly greater volatility than Live Cattle.
## CME Group Agricultural Commodity Product Complex: Futures, Options, and OTC Cleared Swaps

### Grains and Oilseeds:
- Corn Futures, Options & Swaps
- Mini-sized Corn Futures
- Wheat Futures, Options & Swaps
- Mini-sized Wheat Futures
- KC Wheat Futures and Options
- Wheat-Corn Spread Options
- Soybean Futures, Options & Swaps
- Mini-sized Soybean Futures
- Soybean Meal Futures and Options
- Soybean Oil Futures and Options
- Soybean Corn Price Ratio Options
- Crude Palm Oil Futures
- Ethanol Futures, Options and Swaps
- Oat Futures and Options
- Rough Rice Futures and Options

### Livestock:
- Feeder Cattle Futures and Options
- Live Cattle Futures and Options
- Lean Hogs Futures and Options

### Dairy Products:
- Butter Futures and Options
- Butter Spot Call
- Milk Class III Futures and Options
- Milk Class IV Futures and Options
- Cheese Futures and Options
- Cheese Spot Call
- Nonfat Dry Milk Futures and Options
- Nonfat Dry Milk Spot Call
- Dry Whey Futures

### Weather
- Heating Degree Day and Cooling Degree Day futures and Options
- Hurricane Futures and Options
Cash Market Contracts

- Spot purchase or sale
- Cash forward sale
- Long term purchase agreement
- Basis contract

Although they are cash market instruments, most are based on a futures or options contract.
Economic Functions of CME Group Agricultural Products

1. Price Discovery
   • Transparent Price Information
   • Cash contracts based on futures or options contracts
   • Two-way price impact
     • Futures & options market contracts impact cash market contracts
     • Cash market contracts impact futures markets

2. Price Risk Management
   • Use CME Group products and services to protect cash market positions and anticipated positions
Types of Market Participants

**Hedgers**

- Have positions in the cash (physical) market
- Do not like price risk but must accept it and manage it

**Speculators**

- Do not have positions in the cash (physical) market
- Look for price risk – trading opportunities may exist where risk exists

**Risk shifts from hedgers to speculators**
Liquidity is highly important:

- Easy to find counterparties
- Lower transaction costs
Corn Futures and Options: Average Daily Volume & Open Interest
Soybean Complex Futures and Options:
Average Daily Volume & Open Interest
CBOT and KCBT Wheat Futures and Options:
Average Daily Volume & Open Interest

- Futures ADV
- Options ADV
- Futures+Options OI
Lean Hogs Futures and Options:
Average Daily Volume & Open Interest

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Market Participants by Type

Percentage of Open Interest by Category
Corn

- Non-Reportable
- Non-Commercial
- Commercial
- Index
- OI

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Product Innovation

CME Group has enhanced Agricultural option suite by successfully launching innovative option products over recent years:

- Calendar Spread Options (CSOs)
- Weekly Options
- Short-Dated New Crop Options (SDNCO)
Short-dated New Crop Options

• Definition:
  - The Short-Dated Options on the deferred (new crop) months are early expiring options that reference the December Corn Contract, November Soybean Contract and July Wheat Contract

• Key Benefits:
  - Cost-effective: lower premiums due to lesser time value
  - Facilitate hedging early in the planting and growing season
  - Manage risk during specific windows of the growing season at reduced costs
  - Useful for trading around key USDA reports
  - Allow Greek sensitivity hedging
  - Can be used to hedge old/new crop Calendar Spread Options (CSOs) positions
  - Arbitrage opportunities between outrights, CSOs and Short-Dated options
# Contract Specifications

<table>
<thead>
<tr>
<th>Contract Term</th>
<th>Short-Dated New Crop Corn Options</th>
<th>Short-Dated New Crop Soybean Options</th>
<th>Short-Dated New Crop Wheat Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underlying Contract</td>
<td>The December Corn futures contract (5,000 bushels) nearest to the option expiration.</td>
<td>The November Soybean futures contract (5,000 bushels) nearest to the option expiration.</td>
<td>The July Wheat futures contract (5,000 bushels) nearest to the option expiration.</td>
</tr>
<tr>
<td>Strike Price Interval</td>
<td>Five (5) cents per bushel. More details on strike price intervals are outlined in Rule 10A01.E.</td>
<td>Ten (10) cents per bushel. More details on strike price intervals are outlined in Rule 11A01.E.</td>
<td>Five (5) cents per bushel. More details on strike price intervals are outlined in Rule 14A01.E.</td>
</tr>
<tr>
<td>Tick Size</td>
<td>1/8 of one cent per bushel ($6.25 per contract)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daily Price Limit</td>
<td>Same as the daily price limit applied to standard and serial options.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract Months</td>
<td>March, May, July, September</td>
<td>March, May, July, September</td>
<td>March, May, December</td>
</tr>
<tr>
<td>Last Trade Date</td>
<td>The last Friday which precedes by at least two business days, the last business day of the month preceding the option month.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>The buyer of a futures option may exercise the option on any business day prior to expiration by giving notice to the Clearing House by 6:00 p.m. Chicago time. Option exercise results in an underlying futures market position. Options in-the-money on the last day of trading are automatically exercised.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expiration</td>
<td>Unexercised Short-Dated New Crop options shall expire at 7:00 p.m. on the last day of trading.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trading Hours</td>
<td>CME Globex: 7:00 pm - 1:15 pm CT, Sunday - Friday with a 45-minute break each day between 7:45 am and 8:30 am</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Open Outcry: 8:30 a.m. – 1:15 p.m. CT, Monday - Friday</td>
<td></td>
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</tr>
</tbody>
</table>
Short-Dated New Crop Options (SDNCO)

- 2014 listing cycle for SDNCO on Corn and Soybeans began on 8/26/13 with four contract months: March, May, July, and Sep 2014.

- 2014 listing cycle for SDNCO on CBOT and KC Wheat began on 8/26/13 with three contract months: Dec 2013 and March, May 2014.

- Combined corn, wheat and soybean volume has surpassed 1.23 million since inception.

- Open interest reached peak at 243,213 on 6/21/13, the day July contract expired.


- Soybean set a new record daily volume of 7,706 on 8/12/13.

- 7,454 contracts have traded during the new 2014 cycle; OI reaches 6,631.

- Both CBOT and KC Wheat have traded.
Structuring Minimum Price Contracts with SDNCO

• MPC provides producers with the ability to lock in a minimum price for the production they commit to deliver while still being able to benefit from higher prices that could occur subsequent to the sale.

• To structure an MPC, a grain merchandiser buys an option and incorporates the option premium into the producer’s minimum selling price.

• Producers can benefit from structuring MPC with SDNCO because of SDNCO’s lower time value, and consequently, lower premiums, as illustrated in the table.

<table>
<thead>
<tr>
<th></th>
<th>December Put Option</th>
<th>September Put Option</th>
<th>July Put Option</th>
<th>May Put Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>December Corn Futures Price</td>
<td>$7.00</td>
<td>$7.00</td>
<td>$7.00</td>
<td>$7.00</td>
</tr>
<tr>
<td>Basis</td>
<td>-$0.25</td>
<td>-$0.25</td>
<td>-$0.25</td>
<td>-$0.25</td>
</tr>
<tr>
<td>Forward Price</td>
<td>$6.75</td>
<td>$6.75</td>
<td>$6.75</td>
<td>$6.75</td>
</tr>
<tr>
<td>Option Premium Price</td>
<td>$.67</td>
<td>$.56</td>
<td>$.48</td>
<td>$.38</td>
</tr>
<tr>
<td>Protection Period</td>
<td>326 days (thru Nov)</td>
<td>235 days (thru Aug)</td>
<td>172 days (thru June)</td>
<td>109 days (thru April)</td>
</tr>
<tr>
<td>Offered MPC</td>
<td>$6.08</td>
<td>$6.19</td>
<td>$6.27</td>
<td>$6.37</td>
</tr>
</tbody>
</table>
Weekly Options

- Weekly options on Corn, Soybean, and Wheat futures launched on May 23, 2011.

- Weekly options on Soybean Meal and Soybean Oil launched on September 26, 2011.

- Since launch till the end of Sep 2013, more than 1.4 million contracts have traded.

- 2013 YTD ADV=2,140. Corn is the most active, accounts for 88%, Soybean 10%, wheat/soymeal 2%.

- Sep 2013 total volume=40,868, 22% lower than Sep 2012.

- Record high monthly ADV 5,668 was set in Aug 2012, amid the drought.

- Reduce hedging costs due to low time value, thus low premium.

- Used to hedge short term events such as USDA crop reports and weather forecasts during growing season.

- Market familiarity leading to steady volume almost every day.
Calendar Spread Options (CSOs)

- CSOs for Corn, Soybeans, Wheat, Soybean Meal and Soybean Oil launched in June 2009
- Since launch through the end of Aug 2013, more than 1.15 million contracts traded.
- 2013 YTD ADV = 1,788.
- Sep 2013 total volume=5,076, which is about same as than in Sep 2012.
- A new tool to hedge grain inventory and futures spread risk, especially old/new crop.
- CSOs are sensitive only to the value and volatility of the spread itself, rather than the price of the underlying commodity.
- More efficient and precise than combining options on two different months in an effort to replicate the spread.
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