Section I

Introduction to Futures and Options Markets

Chapter 7: Carrying charges in grain markets

Learning objectives

- Free stocks and carrying charges
- Inverted market or negative carrying charges

Key terms

Carrying charge market or positive carrying charges: Positive carrying charges occur when deferred futures contracts trade at a premium to nearby contracts. Also called a carry market or a market in contango.

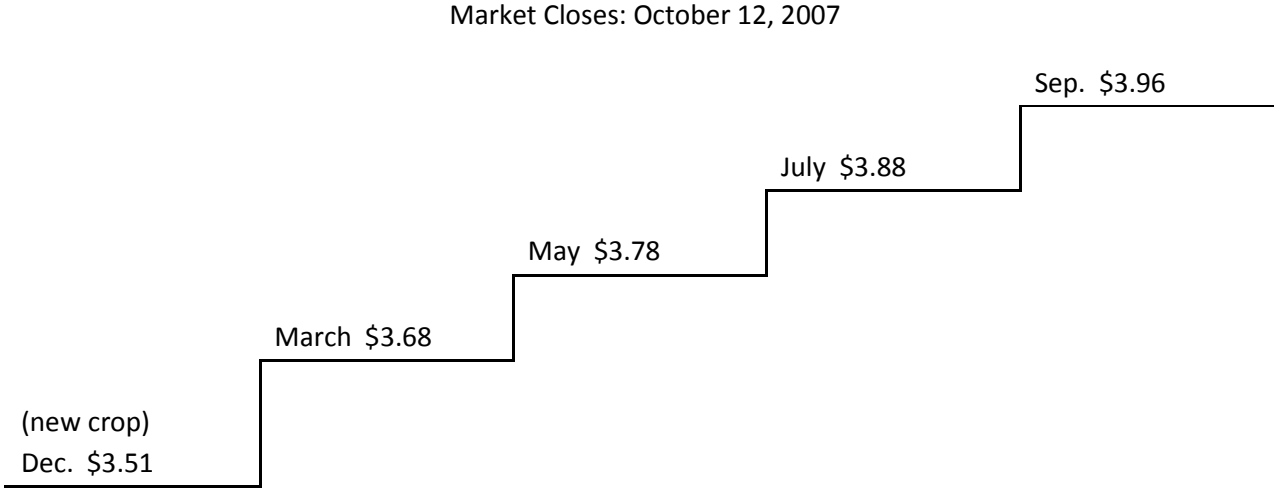
Inverted market or negative carrying charges: An inverted market occurs when nearby futures contracts trade at a premium to deferred contracts. Also called a discount market or a market in backwardation.

We've explored the difference between cash and futures contracts. It is time to explore spreads among futures prices in different delivery months. In seasonally produced crops (i.e. crops that can be stored such as wheat, soybeans, and corn), these price differences are known as carrying charges. Carrying charge can be positive or negative. Positive carrying charges occur when deferred futures contracts trade at a premium to nearby contracts. Negative carrying charges, more commonly known as an inverted market, occur when nearby futures contracts trade at a premium to deferred contracts.

Carrying charges are determined by trading activity in the market. Carrying charges change daily – some days increasing and becoming more positive, other days decreasing and becoming smaller or negative. These changes can tell us a lot about the bullish or bearish tone of the market.

Positive Carrying Charges

The following is an example of a carrying charge market in corn. There is nothing particularly special about this day or year. The market price structure shown is representative of many different years.



Why the different prices? Why is July corn worth 10 cents per bushel more than May, which is valued at 10 cents more than the March, which is valued at 17 cents more than December? Don't all contracts reflect the same grade (#2 yellow) of corn? Don't all contracts call for delivery in the same form (shipping certificates) and location (Illinois River)? Same grade, delivery and location – shouldn't they all reflect the same price?

Many people believe that July corn trades at a premium to December corn because the market expects prices to rise in the months ahead. But expectations are not the reason for these price differences. The principle reason for these price differences are storage costs, also known as carrying charges. Positive carrying charges occur when deferred contracts trade at a premium to nearby contracts. Positive carrying charges are common when free supplies of grain are large.

Determined by the market, carrying charges are constantly sending signals and incentives to store grain for later sale, or price grain and ship it today. Carrying charges tell merchandisers, processors and exporters what the market will pay for storage.

To the individual who does not own a delivery facility, actual carrying charges include the cost of commercial storage, interest on funds invested, and insurance. It is possible to calculate a full carrying charge in the futures market, using the following formula:

full carry =[(price * interest rate)/12 + (monthly storage rate)] * # of months

As an example, let's calculate the full carrying charge in the corn market. Let's use the December price of $5.00 per bushel, 4% interest, and a 5 cent per month commercial storage rate.

Full carrying charge between December and March corn futures...

($5.00 * .04)/12 = $.020 or 1.67 cents per month interest
+ 5.00 cents per month storage rate
6.67 cents per month
* 3 months
20 cents, full carry between December and March

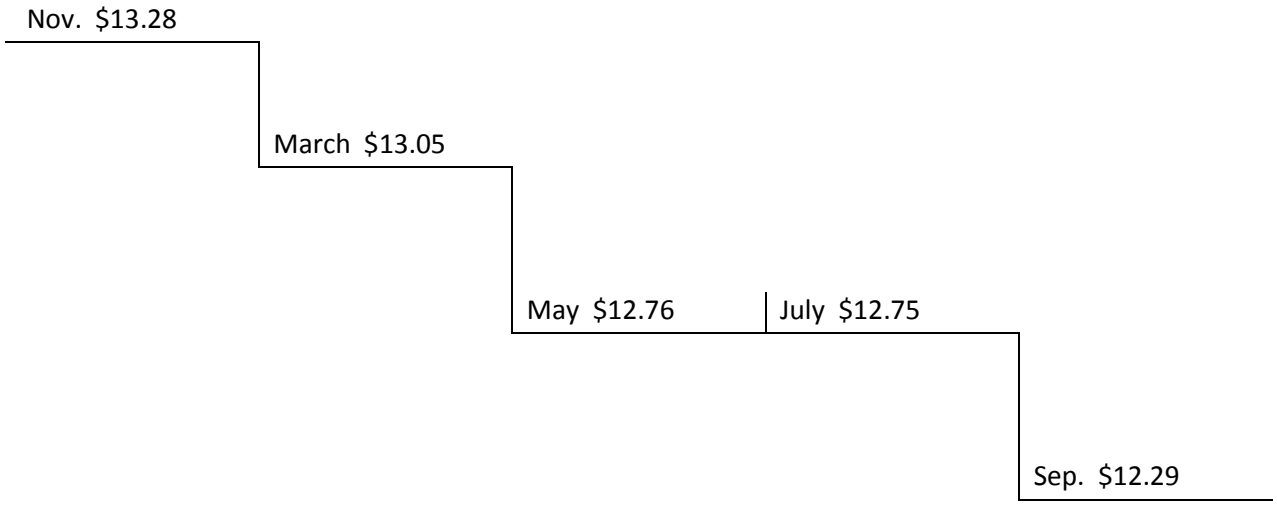
Carrying charges will not exceed the full cost of carry, as calculated by this formula. In fact, carrying charges rarely get wider than 90% of a full carry because elevator owners are able to store grain for less than the full commercial rate.

Large crops lead to large stocks of grain, which generally leads to lower prices and larger carrying charges.

Inverted (aka Negative) Carrying Charges

An inverted market occurs when distant futures contracts trade at lower prices than nearby futures. The following is an example of an inverted market in soybeans at the Chicago Board of Trade.

Market Closes: August 23, 2013



Inverted markets prevail when supplies are small - a scarcity of stocks. The market says "we will pay a premium if you deliver now!" An inverted market reflects a negative carrying charge, or negative return to storage. Unlike a carrying charge market, no theoretical maximum of an inverted market can be estimated. Inverses can get very large when crop supplies are short.

Despite the lack of incentive, some grain will still be held in storage. Processors and merchandisers need grain stocks, regardless of the incentive to store. How can an export elevator be ready to load an incoming vessel with no stocks on hand? How can a flour miller continue to supply bakeries without at least a minimal amount of wheat stocks on hand?

Processors and merchandisers will carry stocks in an inverted market, but they will work hard to minimize inventories.

Small crops lead to smaller stocks of grain, which generally leads to higher prices and smaller carrying charges, or inverses.

Further reading

Self-Study Guide to Hedging with Grain and Oilseed Futures and Options (handbook), CME Group, April 2012 http://www.cmegroup.com/trading/agricultural/self-study-guide-to-hedging-with-grain-and-oilseed-futures-and-options.html

Exercise #7:

Log into a Commodity Challenge game and click on one of the commodities under the Futures tab. This will take you to the CME website and the recent futures market prices will be shown.

Look at the next few futures contract prices. Is the price for the next contract delivery month higher or lower than the first?

Continue to look down the list of prices at later delivery months to determine if the market is a carrying charge market or an inverted market.