

AGEC321, Fall 2011

Quiz 3: Solutions

December 6, 2011: 45 minutes

1. Why do speculators who participate in the futures market speculate? Most people are risk averse; why would anyone wish to take on risk? Can the speculators benefit? If so, explain the mechanism by which they can benefit. If not, explain why not. (4 points)

By taking on risk, individuals are able to benefit from favorable events. For a speculator who takes a particular position in a commodities market, prices that move in the favorable direction can result in substantial gains. For example, if I expect prices to increase in the future, I will take a long position on a futures contract. If prices do increase, then I can offset my long position with a short, and gain the difference in prices.

2. We have discussed how agricultural producers and consumers can participate in futures markets to hedge away price risk in local markets. Suppose these agricultural market participants *do not* wish to directly use futures markets (i.e., do not sell or purchase futures contracts). How can these non-participants still improve their marketing strategies and opportunities by tracking changes in the futures market? (6 points)

Futures markets provide information about what market participants expect prices to be in the future. For an agricultural market participant that is developing marketing strategies that depend on future realizations of prices, observing trends and fluctuations of futures prices would enable the participants to gather some knowledge of their expected future net revenues.

3. In futures markets, there are several types of “orders” that a participant can take. The type of order that we have discussed in class is a *market order*. When a participant puts out a market order, they are simply going short or long on a futures contract at the price the contract is currently trading. Another type of order is a *stop order*, which allows you to specify to the broker to buy or sell a futures contract at a particular price.

Suppose that you are a speculator who has gone short on a futures contract. You know that you can lose quite a bit of money if prices move against you. How can you use a stop order to minimize market losses? (6 points)

The speculator can specify a cut-off price to the broker at which an offset market order will be placed. That is, if I am not willing to continue to participate in the market if prices move too high (i.e., I don't want to continue paying margin calls), I can specify a amount at which my short position will be offset if prices rise above the amount. For example, if I sold a contract at \$6.00/bu and specify a cut-off price of \$6.50/bu, my broker will offset my short position if prices rise to \$6.50 or higher. In this manner, I am able to stop losses from continuing or very large losses from occurring.

4. Consider the two patterns for the per pound price of live (fed) cattle (shown on next page). The average price is shown by the horizontal line, and it is the same in both scenarios at \$0.84/lb.

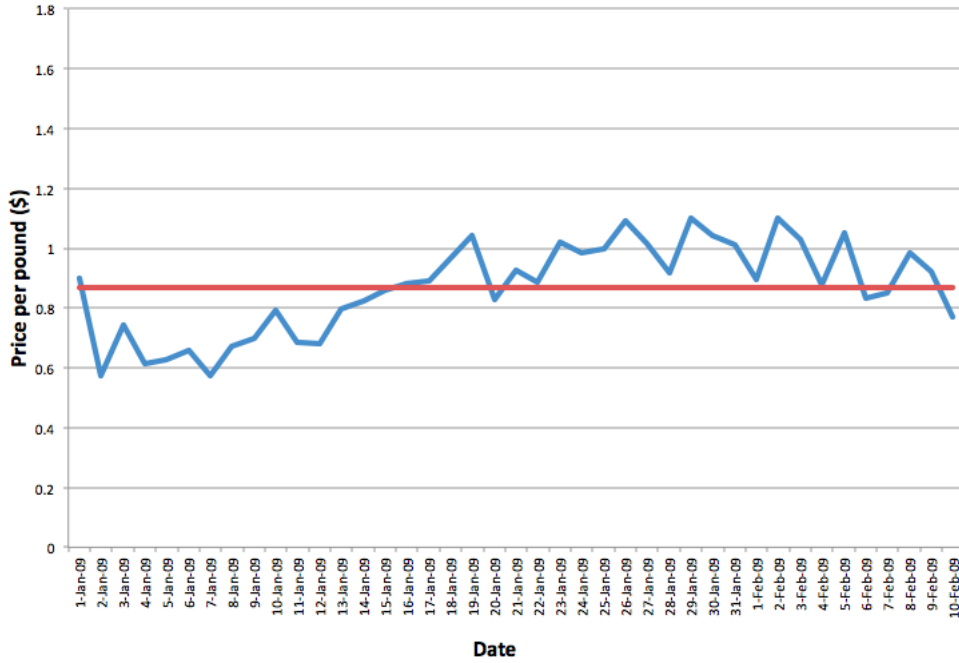
(a) As a speculator in the futures market, which scenario do you prefer? Why? (4 points)

For a speculator who is willing to take on risk, Scenario B is the preferred market scenario. Because the volatility of prices is much higher in this scenario, a speculator can earn a significant payout if prices move by a large amount in the favorable direction.

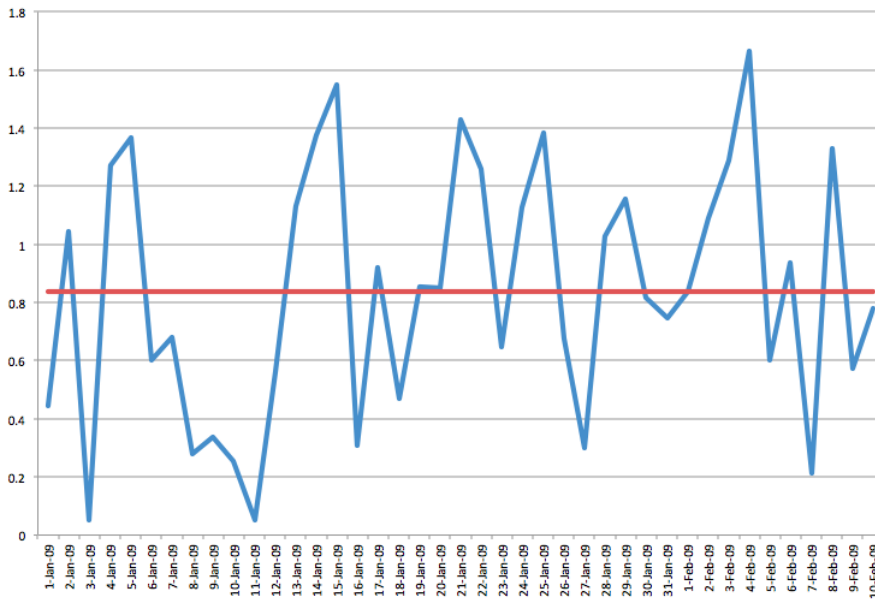
(b) As a producer/consumer of live cattle, which scenario do you prefer? Why? (4 points)

For a producer/consumer, Scenario A is the preferred market scenario. Price variability is much smaller in this market, which provides for a much less risky mechanism to hedge local price risk.

a.) Scenario A



b.) Scenario B



5. It is currently December and you are an exporter of corn. You have negotiated with a Chinese importer to sell 52,500 bushels of corn to them at \$6.20/bushel in May. You will purchase the corn in your local market and then ship it to China. To minimize price risk, you wish to hedge using futures markets. Each May corn futures contract is for 5,000 bushels and is trading in December for \$6.05/bu. Assume that at the time that futures contracts expire, the futures and local prices converge (are the same).

- (a) What is your expected total revenue if the May futures contract price in December did not change (i.e., was the same in May as it is in December)? (5 points)

$$E[Profit] = (52,500 \times [\$6.20 - \$6.05]) = \$7,875$$

- (b) What position are you in the local market? (2 points)

In the local market, you are naturally short, because a drop in prices implies that you will be able to incur a lower cost in purchasing corn.

- (c) What position would you take in the futures market to hedge your price risk? (2 points)

To offset your naturally short position, you would take a long position in the futures market.

- (d) If the margin requirement to enter the futures market is 7%, what is the total amount of money that you will need to initially deposit into your margin account? (4 points)

$$Margin = 10 \text{ contracts} \times 5,000 \text{ bushels/contract} \times \$6.05/\text{bu} \times 7\% = \$21,175$$

- (e) Suppose that in May, the price of a May corn futures contract is \$6.25/bushel. Determine the following:
- Equity in the local market. (5 points)
 - Equity in the futures market. (4 points)
 - Your overall profit/loss from exporting corn to China. (4 points)

Local market

Costs:	$52,500 \times \$6.25 = \$328,125$
Revenue:	$52,500 \times \$6.20 = \$325,500$
Total:	$\$325,500 - \$328,125 = -\$2,625$

Futures market

$$(F_{May}^{May} - F_{May}^{Dec}) : (\$6.25 - \$6.05) \times 10 \times 5,000 = \$10,000$$

Total

$$\text{Local equity} + \text{Futures equity} : -\$2,625 + \$10,000 = \$7,375$$

- (f) If you did not hedge using futures markets, what would have been your overall profit/loss from exporting corn to China? Did you make the right decision to hedge? (5 points)

If you didn't hedge, you would have been subject to the entire local price risk. That is, you would have lost \$2,625. By hedging away most of the price risk using the futures contract, you were able to recover \$7,375. The unhedged 2,500 bushels resulted in a \$500 loss.