AGBE 321

Problem Set 5

1. In your own words (i.e., in a manner that you would explain it to someone who has not taken this course) explain the concept of offsetting futures contracts. When/why would you offset a futures contract? How would you offset a particular futures market position?

2. What is the difference between a futures contract price and a local cash price? What is the relationship among these two prices? Which price would a Montana farmer/rancher care most about? Why?

3. In your own words (i.e., in a manner that you would explain it to someone who has not taken this course) explain the concept of margin accounts and why they are necessary.

Consider the following charts describing December soft red wheat futures prices and December corn prices, both contracts traded on the Chicago Mercantile Exchange.

Source: Chicago Mercantile Exchange.

4. Provide economic intuition for the similar *price movements* and their *timing* observed between August and October. Remember that futures contracts reflect rational expectations about the supply and demand of the commodity.

Source: Chicago Mercantile Exchange.

5. Why doesn't the price of wheat contracts exactly mirror reflection of corn futures prices?

6. Explain the apparent break in similar price movements after October. If you have not been following these markets, then you will need to do some research to determine the market events that have caused these divergences to occur.

Suppose that you are a speculator betting on the hard red winter wheat market. You wish to take on a short position with five (5) futures wheat contracts at the price \$7.30/bu. The associated margin requirement is 15%. Respond to the following:

7. Why would it make sense to take on a short position in the HRW wheat market?

8. Argue that taking a short position is the wrong decision.

9. What would be the margin requirement for this transaction? That is, how much money would you be required to deposit into your margin account?

10. Currently, you have \$10,000 in liquid assets. Using the margin requirement from before, *Reproduce* the following table to describe the following:

    (a) How much money will be added (+) or subtracted (−) from your margin account when the futures contract is marked-to-market (margin call).

(b) How much is in the margin account after the margin call (assume that you must either get the margin account back to the margin requirement level or maintain all of the positive market returns in the margin account).

(c) How much money you will have to add from your liquid assets into the margin account to maintain the original margin requirement.

(d) What the new price of the futures contract when it is marked-to-market.

(e) At which point, if any, will you be placed out of the futures market and why.

Make sure to show your work when determining each of the values in the table.

Day	Price when market opens	Price change	Margin call	Margin account	Liquid assets used to replenish margin account	Liquid assets remaining	Price after marking-to-market
1	$7.30	+ $0.10					
2		− $0.20					
3		− $0.15					
4		+ $0.25					
5		+ $0.30					
6		+ $0.05					
7		− $0.25					
8		− $0.40					

11. Repeat the above exercise, but assume that you have $25,000 in available liquid assets and the market behaves is as following:

Day	Price when market opens	Price change	Margin call	Margin account	Liquid assets used to replenish margin account	Liquid assets remaining	Price after marking-to-market
1	$7.30	+ $0.10					
2		+ $0.20					
3		− $0.15					
4		− $0.10					
5		+ $0.30					
6		− $0.05					
7		− $0.25					
8		− $0.15					

12. Futures markets intuition.

(a) Consider two markets—a malt barley market and a spring wheat market. Malt barley does not have an associated futures contract while spring wheat does have a well-established contract traded on the Minneapolis Grain Exchange. This implies that there are no speculators participating in the malt barley market and many speculators affecting spring wheat prices. Which market, malt barley or spring wheat, do you expect to have more price variability/volatility? That is, which market has more uncertainty about prices in the future? Discuss the economics behind your intuition.

(b) Discuss the benefits and costs of partial hedging. When would a partial hedging strategy be appropriate?

(c) True or false: basis is easier to predict than local cash or futures prices? Justify your answer.

13. You are a miller. It is currently November and you have forward contracted to deliver 450,000 pounds of flour at $25 per hundredweight (per 100 lbs.) in March. The extraction rate of flour from wheat is approximately 75%, implying that you will need 600,000 pounds of wheat. There are approximately 60 pounds in each bushel of wheat. After you sell the contracted flour, you wish to immediately replace the wheat for continuing your operations. You will purchase the wheat in your local market, but you wish to hedge away the possible price risk associated with waiting to purchase wheat in March. In November, the March spring wheat futures contract is priced at $8.10/bu and there is a 5% margin requirement to enter the market.

(a) If the March spring wheat futures price was the same as in November with 0 basis differential, calculate your expected revenue, costs, and profit.

(b) What position are you in the local wheat market? Why?

(c) What position would you need to take in the futures market to offset our local market position?

(d) How much money would you need to pay into the margin account?

(e) Suppose that the price of the March spring wheat futures contract in March is $9.55/bu and the local basis is –$0.95/bu. Determine:

    i. Local market conditions (revenues, costs, net local returns).

    ii. Futures market conditions (net gains or losses).

    iii. Overall net returns from the local and futures markets.

14. You're a corn farmer. Assume that average corn yields are 134 bushels per acre and you have a 5,000 acre corn farm. You will store 12% of your harvest and sell the remaining crop to your nearby elevator. Your cost to produce a bushel of corn is $4.00/bu, which you incur on all produced bushels, regardless of whether you decide to sell them immediately or store for later sales. You wish to hedge the expected price risk using futures markets. Respond to the following.

(a) Even though you can use futures markets to hedge away some price risk, you are unable to hedge all of it away. Why are you still subject to some uncertainty?

(b) It is currently December, and the September 2015 corn futures contract is trading at $4.80/bu. The following table describes local and futures prices in September, the month during which you will sell your crop, and the current month, December.

Month	Year	Futures Price	Local Price
September	2008	$ 3.25	$ 3.14
September	2009	$ 4.10	$ 3.98
September	2010	$ 4.20	$ 4.01
September	2011	$ 5.89	$ 5.77
September	2012	$ 5.24	$ 5.11
September	2013	$ 4.75	$ 4.61
September	2014	$ 5.61	$ 5.48

If the December price of a September 2015 futures contract reflected the *true* price of corn in September 2015, what are your expected total revenues, total costs, and total profits?

(c) Suppose that you take a position in the futures market to hedge price risk. What position would you take? Why?

(d) When you are ready to sell the corn in September 2015, you offset your futures position at the price of $4.75. The actual basis in September is –$0.19/bu. Calculate your actual total net revenues in the local market, total equity in the futures market, and your overall profit.

(e) If you had not hedged, what would have been your net revenues?