

Assignment Number 4

If you can do these problems correctly, then you should do well on the mid-term exam.

It is March 1, and a Central Iowa farmer has 50,000 bushels of corn and 20,000 bushels of soybeans in on-farm storage. You have the following data:

Price	Corn	Soybeans
March Local Spot Price	1.96	4.84
March CBOT Futures Price	2.20	5.15
July Local Forward Price	2.10	5.00
July CBOT Futures	2.37	5.34
Harvest Futures Price (December for corn, November for soybeans)	2.54	5.41
Harvest Time Local Forward Price	2.29	5.09

- A. Calculate the current basis and the expected basis in July for this farmer for both crops. Is basis expected to weaken or strengthen between now and July? Give one example of a local market situation that could explain this change in expected basis.

- B. Suppose that the current risk free interest rate is 8% and the increase in forward price over the current spot price covers the total cost of carry, which you assume includes the opportunity cost of money and the cost of storing the grain. Please calculate the present value of the implied per-bushel cost of storage from March to July for both corn and soybeans. If there is a difference, please provide one explanation for it including in your explanation the concept of convenience yield.

- C. Suppose that on March 2, the farmer hedges all 50,000 bushels of corn and 20,000 bushels of soybeans on the CBOT July corn and soybean contracts. It is now March 3 and the price of July corn has moved down by 10 cents per bushel and the price of July soybeans has moved down by 25 cents per bushel. What has happened to the farmer's net cash position?

- D. Suppose that on March 2, the farmer hedges all 50,000 bushels of corn and 20,000 bushels of soybeans by forward contracting with his local elevator. It is now March 3 and the local price of corn has moved down by 10 cents per bushel and the price of soybeans has moved down by 25 cents per bushel. What has happened to the farmer's net cash position? If the local forward price also decreases by 10 cents for both commodities, then what is the value of the two forward contracts?

- E. The loan rates in this Central Iowa county are 5.15 for soybeans and 1.80 for corn. How do these loan rates influence the farmer's hedging decision for the crops that he will plant this spring?

It is now March 1. Suppose this farmer decides he wants to lock in a price on new crop corn. He expects to harvest 200 bu/ac on 250 acres of corn. He must decide whether to hedge using CBOT futures or a forward contract from the local elevator.

- F. First describe how the farmer would actually hedge the 50,000 bushels.
- G. What would you advise the farmer to do if he expects the local basis to strengthen between now and the time of delivery?
- H. The farmer decides to hedge his crop on the CBOT. It is now harvest time and Elywinn Taylor was correct: there was a severe drought in the Western Corn Belt. Instead of 200 bu/ac our farmer harvests only 100 bu/ac. Furthermore, the December futures price rises to \$3.50/bu due to a shortage of corn. The local cash price at delivery was \$3.25/bu. Given that the farmer spent \$350/ac to raise the crop (including cash rent), describe the farmer's net profits from farming plus hedging.
- I. Now calculate the net profit of the farm if addition to the hedge, the farmer had bought crop insurance, with a yield guarantee set to 75% of the expected yield of 200 bu/ac. Lost bushels are paid off at the insurance price of \$1.90/bu. The cost of the insurance premium is \$10/ac or \$2500 for the 250 acres.
- J. The farmer does some calculating and finds that he can almost eke out a positive cash flow position if he can lock in a price of \$2.29 and sell at least 150 bu/acre. He figures that he can do this by hedging 75% of expected production and buying the 75% crop insurance. Recalculate profits to see if the farmer can accomplish this feat of nearly breaking even. If you find that he cannot get close to breaking even, please explain why.
- K. Recalculate the farmer's profits if he had purchased Revenue Assurance with harvest price option at 75% coverage. This product costs the farmer \$13/acre. The harvest price option increases the insurance guarantee so that "lost" bushels are paid out at the harvest time CBOT price if the harvest time price is higher than the spring time price, which it is in this example.