The University of Texas at Austin
In-Class Work 4
M339D Introduction to Financial Mathematics

February 11, 2026

Forward contracts.

Problem 4.1. (5 points) A soy-bean farmer shorts forward contracts on soy in an amount matching his crop volume and with delivery at harvest time. Then, he is considered:

a. an arbitrageur.
b. a broker.
c. a speculator.
d. a hedger.
e. None of the above.

Solution. (d)
The farmer is a hedger because he uses the forward contracts to reduce the risk of his position in the underlying asset, i.e., his crop.

Problem 4.2. Derivative securities can reduce the risk of both the buyer and the writer of the security. *True or false?*

Solution. TRUE
Forward contracts are an example of this situation.

Problem 4.3. A short forward contract has an unlimited loss potential. *True or false?*

Solution. TRUE
A short forward contract has an unlimited loss potential because the price of the underlying asset can rise indefinitely, leading to potentially unlimited losses for the short position.

Problem 4.4. A farmer produces one million bushels of corn. The total cost of production is \$1.3 million. The farmer entered a forward contract to hedge at a forward price of \$2.50 per bushel on one million bushels. What is the farmer's profit?

Solution.

$$10^6(2.50 - 1.30) = 1.2 \times 10^6.$$

Problem 4.5. Assume that farmer Brown is uncertain about his crop yield. Based on past experience, he thinks the following is a good model:

- 100,000 bushels with probability $1/4$;
- 80,000 bushels with probability $3/4$.

How many forward contracts do you think farmer Brown should short to hedge against fluctuations in corn prices at harvest time? Explain your way of thinking ...

Solution. This is an open-ended problem of sorts. Depending on the farmer's attitude toward risk, he might hedge using any number of contracts between 80,000 and 100,000.

However, the most common way of thinking is to say that farmer Brown wants to address what happens on average, i.e., to hedge the expected number of bushels. In this problem we get

$$\frac{1}{4} \times 100000 + \frac{3}{4} \times 80000 = 25000 + 60000 = 85000.$$

Problem 4.6. **Pancakes, Inc.** produces chocolate chip pancakes. It longed a forward contract on 100 lbs of chocolate chips at \$3.00 per pound. Total fixed revenue is $\$2,000$ for the pancakes produced with the above chocolate chips. Other costs total \$1200. Find the company's profit.

a. $2,000$

b. $1,700$

c. 800

d. 500

e. None of the above.

Solution. (d)

$$2000 - 1200 - 300 = 500$$

Problem 4.7. The **Extra-Healty Cereal (EHC)** company longed 20,000 forward contracts on corn at \$2.80 per bushel. The revenue from cereal made with the above corn is \$200,000 while the other (non-corn) aggregate fixed and variable costs amount to \$120,000. What is the EHC's profit?

Solution.

$$200,000 - 120,000 - 20,000 \times 2.80 = 24,000.$$