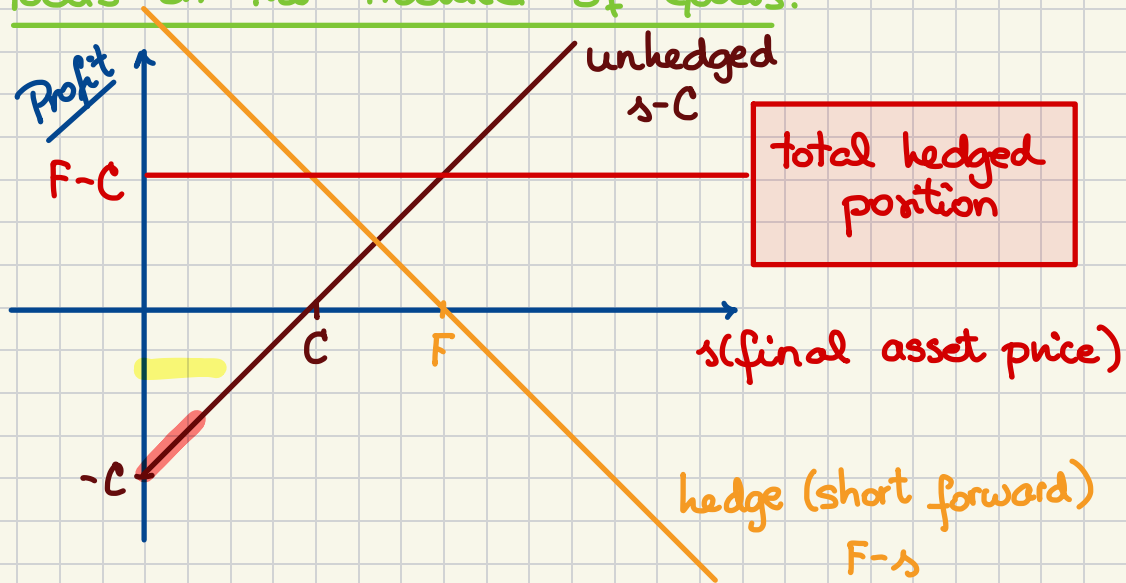


Hedging Using Forward Contracts.

Focus on the Producer of Goods.



Algebraically:

$$\begin{aligned} \text{Profit (unhedged)} + \text{Profit (short forward)} &= \text{Profit (Hedged)} \\ S(T) - C + F - S(T) &= F - C \end{aligned}$$

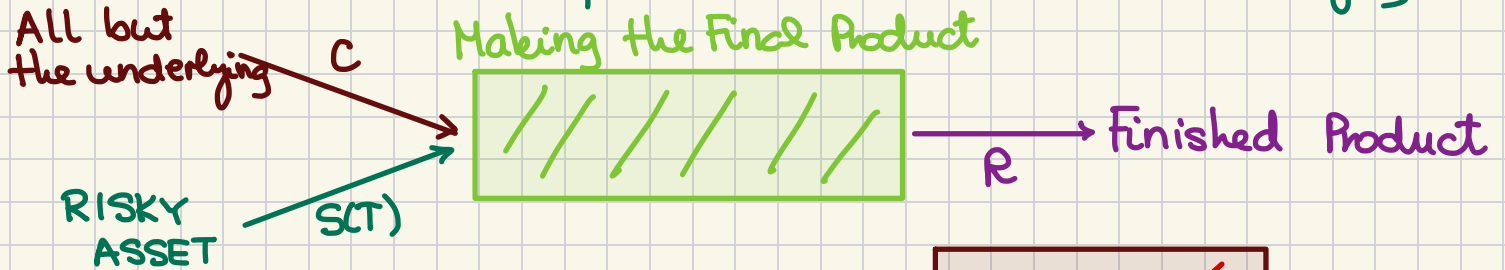
User/Buyer of a Good (to use as raw material)

fixed, deterministic

C... total aggregate costs of production of some final product *without* the underlying asset valued @ time T when the underlying asset is purchased and used

R... "revenue"... the price @ which the user of the risky good can sell the final product valued @ time T

$S(T)$... the market price @ time T of the underlying



The bottom line @ time T :

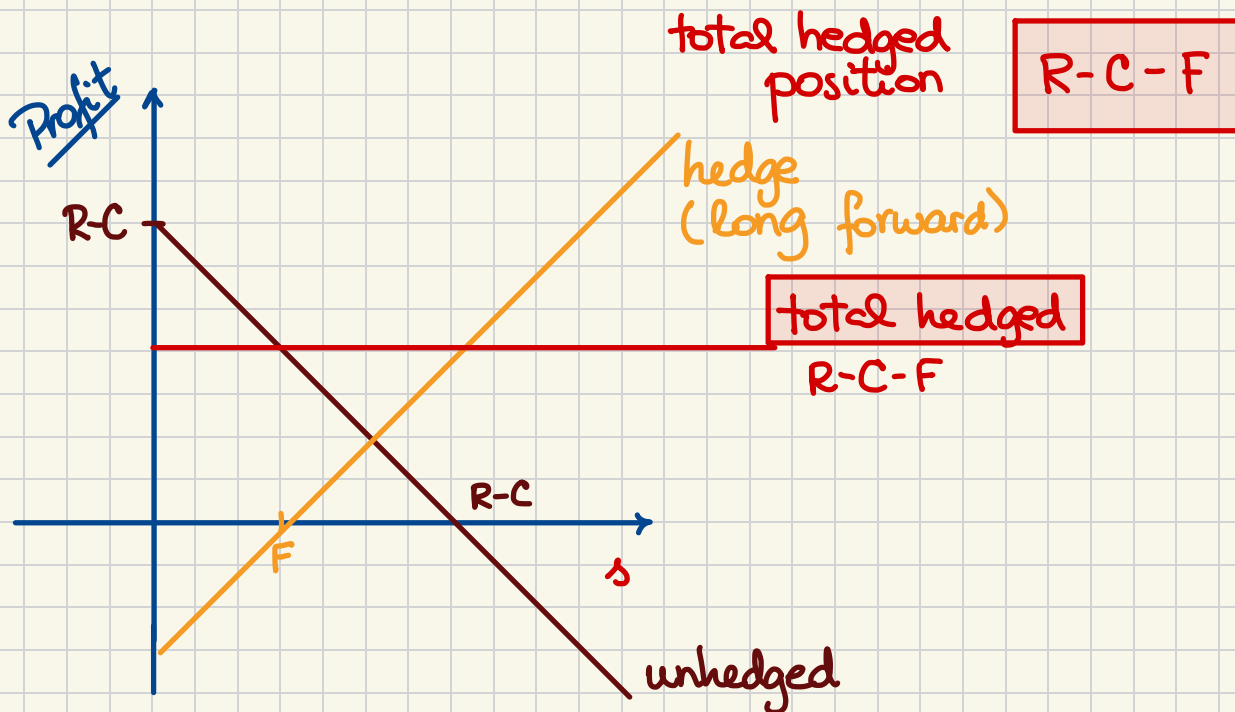
$$R - C - \cancel{S(T)} \text{ unhedged}$$

The appropriate hedge is the

LONG FORWARD (BUY FORWARD)

$$\cancel{S(T)} - F$$

hedge



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Problem Set #4

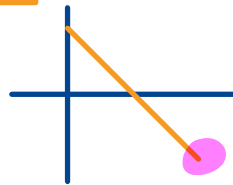
Forward contracts.

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.

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

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



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?

→ ∴ $(2.5 - 1.3) \cdot 10^6 = 1.2 \cdot 10^6$ □

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 ...

Idea #1: The Expectation $\frac{1}{4}(100\,000) + \frac{3}{4}(80\,000) = 85\,000$

Idea #2: The Median

Idea #3: The Mode/The subhedge 80000

Idea #4: The Superhedge