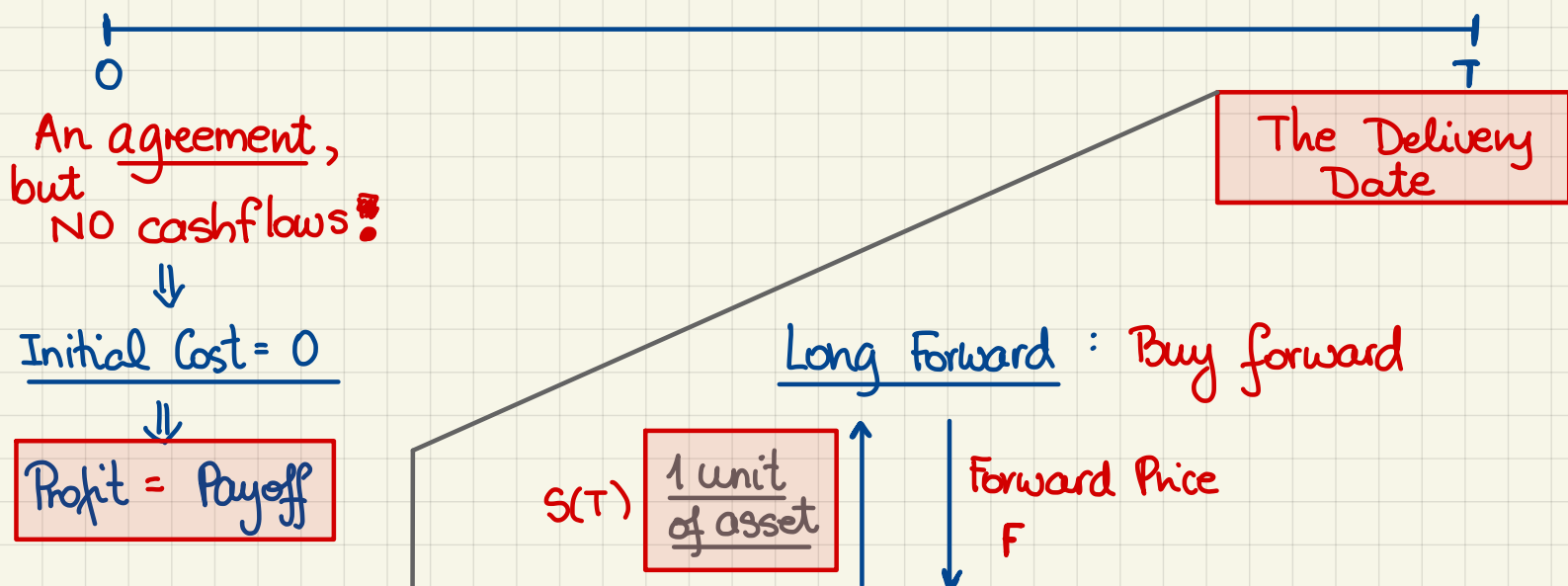


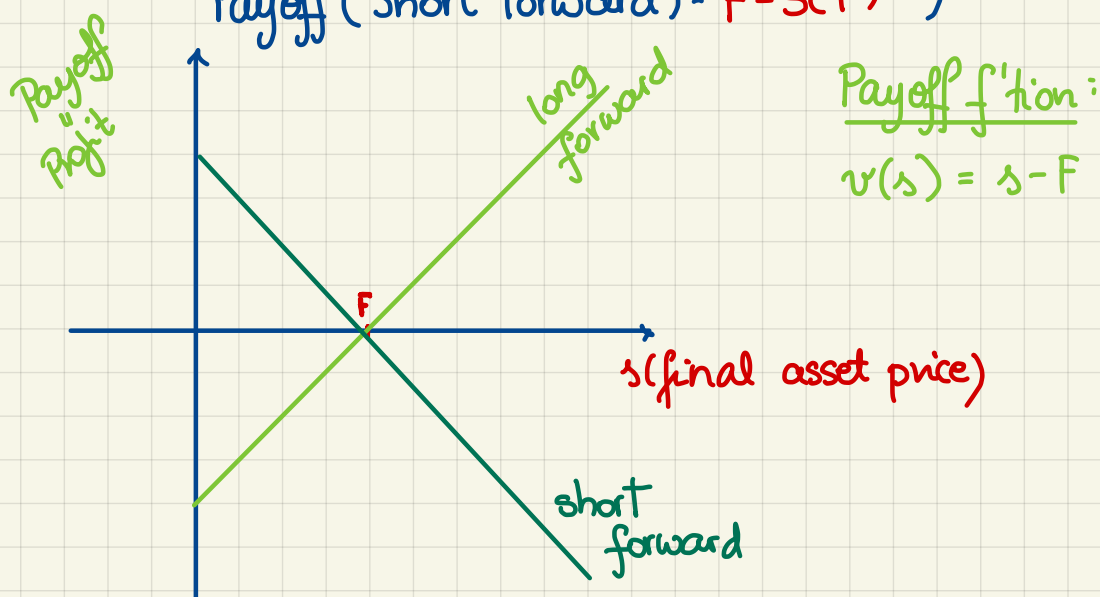
M3390: October 3rd, 2022.

Forward Contracts [cont'd]

* A binding contract on both sides! *

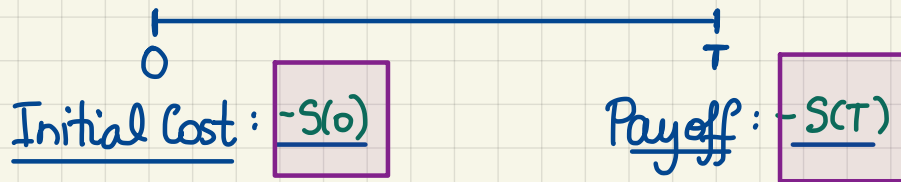


$$\left. \begin{aligned} \text{Payoff (Long Forward)} &= S(T) - F \\ \text{Payoff (Short Forward)} &= F - S(T) \end{aligned} \right\}$$



Problem. [Sample SOA Problem].

Determine which of the following portfolios have the same cashflows as a short sale of a non-dividend-paying stock.



X (i) long forward and a long zero-coupon bond

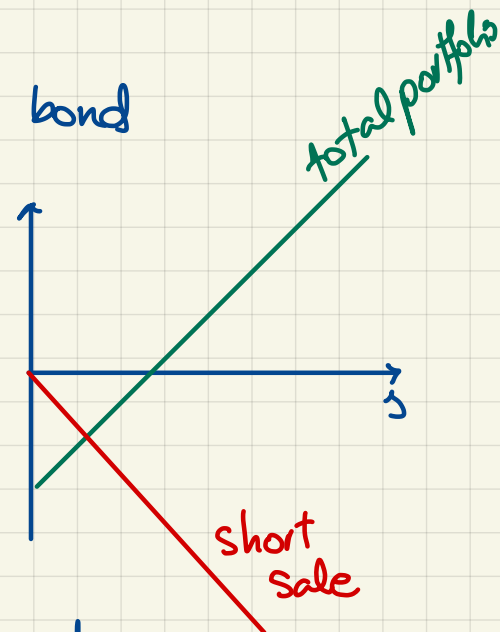
Initial Cost: Price of bond > 0

X (ii) long forward and a short forward

Initial Cost: 0

X (iii) long forward and a short zero-coupon bond

	<u>Init. Cost</u>	<u>Payoff</u>
Long Forward	0	$S(T) - F$
Short bond	$-P$	$-Pe^{rT}$
Total	$-P$	$S(T) - F - Pe^{rT}$



X (iv) short forward and long zero-coupon bond

Initial Cost: Price of bond > 0



(v) short forward and short zero coupon bond

	Init. Cost	Payoff
Short forward	0	$F - S(T)$
short bond	$-P$	$-Pe^{rT}$
Total	$\frac{-P}{\downarrow}$	$\frac{F - S(T) - Pe^{rT}}{\downarrow}$

Short Sale: $-S(0)$ $-S(T)$

If we let the forward price match the redemption amount:

$$F = Pe^{rT}$$

Also matching the bond price to the initial asset price:

$$P = S(0)$$

Note:

$$F = S(0)e^{rT}$$

Important!



Hedging Using Forward Contracts.

Focus on a producer of goods.

C ... total aggregate costs of production valued @ time T

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

