M3392D: September 17th, 2025.

Forward Contracts.

*A BINDING CONTRACT ON BOTH SIDES! *

NO CASHFLOW!

0 — T

Handshake!

DELIVERY DATE (When the cash is exchanged for the asset.)

An agreement:

- the underlying asset: $S(t), t \geq 0$
- the quantity (for us: 1 unit)
- the type of settlement: physical or cash
- T... the delivery date
- F... the forward price

Initial Cost = 0

Profit = Payoff

Long Forward: Buy Forward

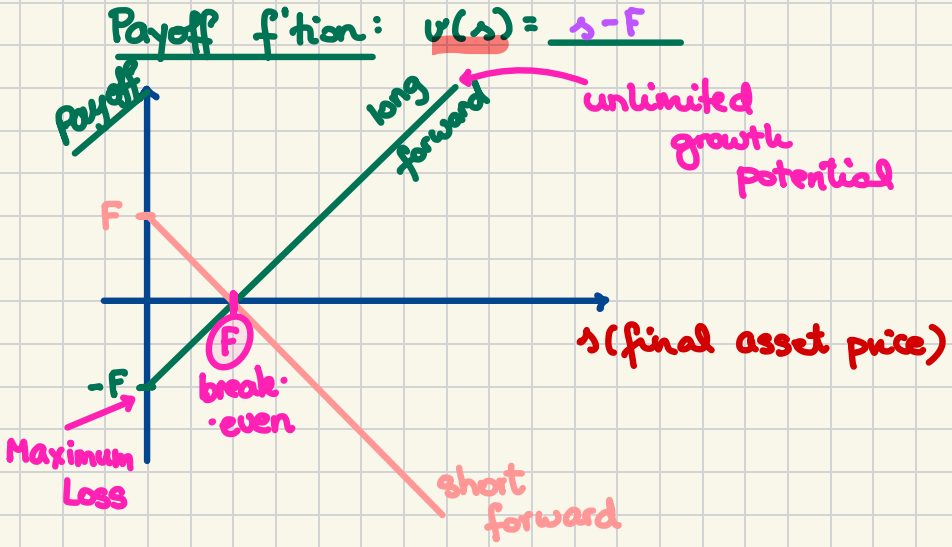
S(T) — 1 unit of asset ↑ ↓ Forward Price — F

Short Forward: Sell Forward

Payoff (Long Forward) = $S(T) - F$

Payoff (Short Forward) = $F - S(T)$

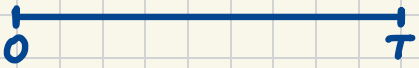
Payoff f'tion: $v(s) = s - F$



A long forward is a LONG position wrt the underlying.

Problem. Sample SOA Problem.

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



Initial Cost: $-S(0)$ (<0) Payoff: $-S(T)$

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

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

	Initial Cost	Payoff
Long Forward	0	$S(T)-F$
Short Bond	$-P$	$-Pe^{rT}$
Total	$-P$	$S(T)-F-Pe^{rT}$

Task: Can you choose F and P so that the cashflows w/ the short sale match?