Ayam Banjade SML HW04

No.

Date

4) If no-arbitrage : 2 portfolios with equal payoff at T must have equal value at all times.

WLOG assume bond pays $1 at T.

Let K → strike price C(t) → Call at t P(t) → put at t

payoff of (A): $S(T) - K$

payoff of (B): $S(T) - K$

↳ share bought for S(t) is worth S(T) ∧ bond's worth K

Let $PV(t)$ be present value (at t) of bond maturing to $1 at T.

Now,

identical payoffs ⇒ (A) ∧ (B) have same price at t.

$$\therefore C(t) - P(t) = S(t) - K \cdot PV(t)$$

which is the put-call parity