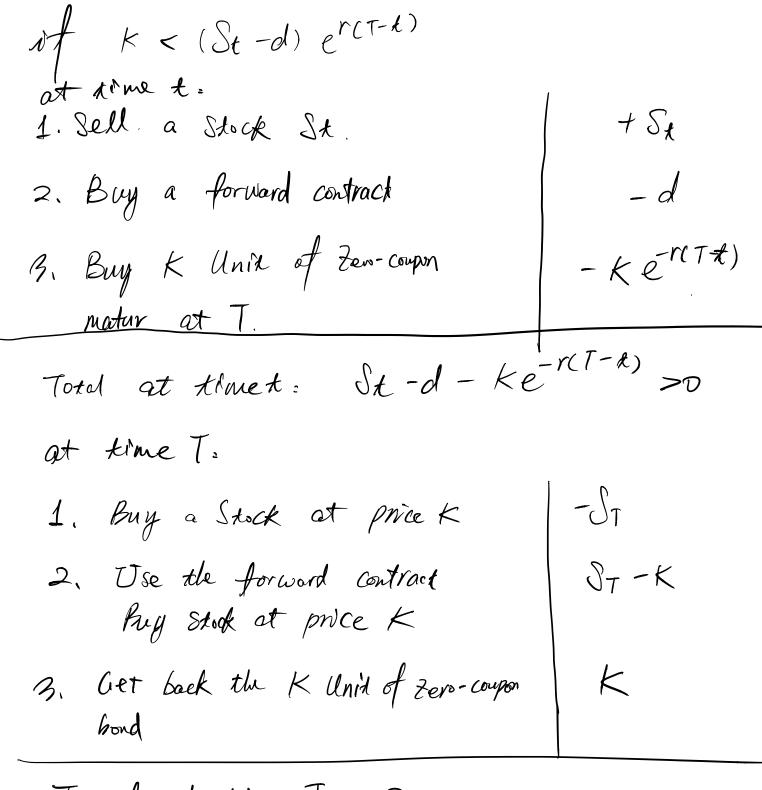
STA 4020 HW1 the skirk price $K = (S_{t} - d)e^{r(T-t)}$ if $k > (S_t - d) e^{r(\tau - k)}$ at skime t: 1. Sell K Unit of Zero-coupon band with face value \$1 and naturity T 2. Buy St Stock -St. 3, sell a forward contract total as simed: $Ke^{-r(T-R)}$ -St+d > 0 ax time T: 1. Pay K Unit Zero-coupon bond. 2. Sell ST to forward contract 3. Seu the ST at price K K-ST.

total at timeT =0

i. $Ke^{-r(T-k)}$ -St+d > 0 i. Arbitrage.

i. $K \leq (St-d) e^{r(T-k)}$



Total at time T = 0

-1. $St-d-ke^{-r(T-k)} > 0$... Arbitrage.

-1. $K = (St-d) e^{r(T-k)}$

(a): the put-call parity:

$$Ke^{-r(T-t)} + Cx(T,K) = Sx + Px(T,K)$$

$$7 \text{ for } 2evo-coupon : 1 e^{-r(T-t)} = 0.9148$$

$$e^{-r \cdot 180} = 0.9948 \Rightarrow r = \frac{1}{180} \log \frac{1}{0.9948}$$

$$47.5 \cdot e^{-r.180} + 4.375 - 50 - 1.45$$

$$=47.5.(0.9948)+4.375-50-1.45$$

cbh

 $= ke^{-r(T-h)} + Ch(T,k) > Sh + Ph(T,k)$

at time t:

1. buy In Stock

2. buy a lut option

3. Sell K Unia Zero-Coupon

bond

4. Sell a Call option

- St

-Pa(T,K)

+ Ca(T,K)

+ ke-r(T-t)

at sime & topol:

 $ke^{-r(T-k)} + C_{k}(T,k) - S_{k} - P_{k}(T,k) > 0$.

at time T:

1. Sell a ST at Call openion at price K

2. Stock price Sy

3. exercise Put option

4. Pay for zero-corpon bond

- (ST-K)+

+ ST

(K-ST)+

-K

H ST>K => - ST+K+5T-K=0.

M STEK => ST + K-ST-K=0.

in the total at time T = 0.

-. The above the total is:

 $ke^{-r(T-h)}+Ch(T,k)-Sh-Ph(T,k)>0$.

i. This is an Arbitrage.

13.

If
$$C < max(S - Ke^{-r(T-A)}, 0)$$

at time t:

1. Sell a call option $(S - Ke^{-r(T-A)}, 0)_+$

2. Buy S stock

3. Sell K Unit zero-carpon $Ke^{-r(T-A)}$

bond

total at time t:

 $(S - Ke^{-r(T-A)}, 0)_+ - (S - Ke^{-r(T-A)}, 0) > 0$

at time T:

1. Sell the S stock at price $(K - S)_+$

K for the call option

2. the stock price

3. Get back money for K

K Unit zero-corpon

had

the total at line T:

$$(K-S)_{+}+S-K$$

if $K-S>0$ => $K-S+S-K$ =0

if $K-S<0$ => $S-K>0$

i. $(K-S)_{+}+S-K>0$