MSE342: Correction to Ques. 3 on MidTerm 2002-03

1 Correction To Ques. 3

There is an error in the solutions posted on the web. The error lies in constructing the second portfolio.

As mentioned in the solutions, Long a Call, Short a Put and K bonds have a payoff of \( F_{T_1} \) at time \( T_1 \) where \( F_{T_1} \) is the future price at time \( T_1 \) for a future contract that expires at \( T_2 \).

We thus need to construct a portfolio that has a payoff of \( F_{T_1} \) at time \( T_1 \).

Consider the following portfolio, Long \( \frac{1}{d(T_1, T_2)} \) forward contracts and \( F_0 \) bonds that expire at \( T_1 \). Now, the payoff of one forward contract at time \( T_1 \) is \((F_{T_1} - F_0) \ast d(T_1, T_2)\). Thus the payoff at \( T_1 \) of \( \frac{1}{d(T_1, T_2)} \) forward contracts is \( \frac{1}{d(T_1, T_2)} \ast (F_{T_1} - F_0) \ast d(T_1, T_2) = (F_{T_1} - F_0) \). The payoff of \( F_0 \) bonds is \( F_0 \). Thus the payoff of the portfolio is \( F_{T_1} \). The cost of the portfolio is \( 0 + F_0 \ast d(0, T_1) \). It costs 0 to buy the forwards. Thus comparing the two portfolios, since the final payoffs are the same for the two portfolios, by no arbitrage the value of the two portfolios is the same at all times before \( T_1 \), in specific at 0.

\[
C - P + K \ast d(0, T_1) = F_0 \ast d(0, T_1)
\]

There was a confusion between forward and future values during the office hours. The analysis presented here with forwards is correct since the forward and future prices are the same at all times. And there shouldn’t be any confusion regarding value of the forward contracts. See text for reference.