Review for Futures

Chapter 22

2. The ability to buy on margin is one advantage of futures. Another is the ease with which one can alter one's holdings of the asset. This is especially important if one is dealing in commodities, for which the futures market is far more liquid than the spot market.

7. a. The closing futures price for the March contract was 1,108.60, which has a dollar value of:

$$\$250 \times 1{,}108.60 = \$277{,}150$$

Therefore, the required margin deposit is: $27,715

b. The futures price increases by: $1,150.00 – 1,108.60 = $41.40

The credit to your margin account would be: 41.40 × $250 = $10,350

This is a percent gain of: $10,350/$27,715 = 0.3734 = 37.34%

Note that the futures price itself increased by only 3.73%.

c. Following the reasoning in part (b), any change in F is magnified by a ratio of (l /margin requirement). This is the leverage effect. The return will be –10%.

8. a. $F_0 = S_0(1 + r_f) = \$150 \times 1.03 = \$154.50$

b. $F_0 = S_0(1 + r_f)^3 = \$150 \times 1.03^3 = \$163.91$

c. $F_0 = 150 \times 1.06^3 = \$178.65$

11. The put-call parity relation states that: But spot-futures parity tells us that:

$$C = P + S_0 - \frac{X}{(1+r_f)^T} \qquad\qquad F = S_0 \times (1+r_f)^T$$

Substituting, we find that:

$$P = C - S_0 + \frac{[S_0 \times (1+r_f)^T]}{(1+r_f)^T} = C - S_0 + S_0 = C$$

16. The parity value of F is: 1,300 × (1 + 0.04 – 0.01) = 1,339

The actual futures price is 1,330, too low by 9.

Arbitrage Portfolio	CF now	CF in 1 year
Short Index	1,300	$-S_T - (0.01 \times 1{,}300)$

Buy Futures	0	S_T − 1,330
Lend	−1,300	1,300 × 1.04
Total	0	9

18. a. The current yield for Treasury bonds (coupon divided by price) plays the role of the dividend yield.

b. When the yield curve is upward sloping, the current yield exceeds the short rate. Hence, T-bond futures prices on more distant contracts are lower than those on near-term contracts.

19. (in notes)

Action	Cash Flows Now	T_1	T_2
Long futures with maturity T_1	0	$P_1 - F(T_1)$	0
Short futures with maturity T_2	0	0	$F(T_2) - P_2$
Buy asset at T_1, sell at T_2	0	$-P_1$	P_2
At T_1, borrow $F(T_1)$	0	$F(T_1)$	$-F(T_1) \times (1+r_f)^{(T_2-T_1)}$
Total	0	0	$F(T_2) - F(T_1) \times (1+r_f)^{(T_2-T_1)}$