

FIN 425 Global Financial Risk Management - Sample Exam I

Professor Koch

Covers: Glossary; Background and Introduction; Hull, Chapters 1-5.

Answer all questions. Points assigned to each problem appear in parentheses.

1. A. Suppose your (U.S.) firm has a payable denominated in Italian Lira, due in six months.
(4) Does *this balance sheet item* represent a transaction exposure for your firm?
Does it represent an economic exposure? Explain.
- (4) B. List four differences between forward and futures contracts.

2. (4) A. Briefly explain what is meant by "hedge accounting" for derivatives.
- (4) B. Briefly discuss the tax treatment of gains/losses on derivatives.

3. Explain the impact of the following transactions on: (i) open interest, and (ii) daily volume.
(2) A. Suppose that two market participants trade a futures contract, where the long position in this trade formerly had been **short** one contract while the other participant formerly had no position in this contract.
(2) B. Suppose that two market participants trade a futures contract, where the long position in this trade formerly had been **long** one contract while the other participant formerly had no position in this contract.

4. A company has a known future cash outflow in a foreign currency (e.g. a payable denominated in Deutschemarks). This payable represents a need to buy foreign currency in the future. This exposure can be hedged by immediately buying foreign currency forward or futures contracts. If the company buys a forward contract, there is no foreign exchange risk. When it buys futures contracts, the marking-to-market process does leave the company exposed to some risk.
(2) A. Explain the nature of this risk.
(8) B. In particular, consider whether the company is better off hedging this risk by buying a futures contract or a forward contract when:
 - (i) the value of the foreign currency falls rapidly during the life of the contract;
 - (ii) the value of the foreign currency rises rapidly during the life of the contract;
 - (iii) the value of the foreign currency first rises and then falls back to its initial value;
 - (iv) the value of the foreign currency first falls and then rises back to its initial value.[Assume that the forward price equals the futures price.]

5. (9) Discuss how the cost of carry framework applies to:
- (i) foreign currency futures; silver futures; (iii) copper futures.
6. (9) Consider a one-year commodity futures contract on an underlying asset with $S = \$10$, where storage costs are 2% (continuously compounded annual rate), the riskfree rate on one-year T.Bills is 6%, and the current futures price is \$10.12. Carefully describe how you would compute the convenience yield.
7. (9) The standard deviation of monthly changes in the spot price of live cattle is 0.8 (in cents per pound). The standard deviation of monthly changes in the futures price of live cattle for the closest contract is 1.4. The correlation between futures price changes and spot price changes is 0.7. It is now October 15. A beef producer is committed to purchasing 400,000 lbs. of live cattle on November 15. The producer wants to use the December live-cattle futures contract to hedge her risk. Each contract is for the delivery of 40,000 lbs. of live cattle. How can the beef producer minimize her risk?
8. (6) A. On March 1 an investor holds 100,000 shares of a certain stock. The market price is \$80 per share. The investor is interested in hedging against movements in the market over the next two months and decides to use the June S&P 500 index futures contract. The futures price is currently 1000 and one contract is for delivery of \$500 times the index. The beta of the stock is 1.5. What strategy should the investor follow?
- (6) B. Explain how the investor in A. above can:
- (i) reduce the beta of his hedged portfolio to 0.75;
 - (ii) increase the beta of her hedged portfolio to 2.0.
- (6) C. Discuss the complications to this hedging problem that reduce its effectiveness (that add to basis risk).
9. (6) A. Suppose zero-coupon spot interest rates with continuous compounding are as follows:
- | Maturity (years) | Rate (% per annum) |
|------------------|--------------------|
| 1 | 12.0 |
| 2 | 13.0 |
| 3 | 13.7 |
| 4 | 14.2 |
| 5 | 14.5 |
- Calculate the forward rates for years 2, 3, 4, and 5.
- (6) B. According to the Liquidity Premium theory of the term structure of interest rates, what are the implications of the zero-coupon yield curve in problem A. above?

10.(9) Compare and contrast the valuation models for the following types of futures contracts:

- (i) A futures on an asset that provides no income;
- (ii) A futures on an asset that provides a known income;
- (iii) A futures on an asset that provides a known dividend yield.

11. Consider a futures contract on a T. Bond with:

maturity = six months;

spot price = $S = \$66,000$;

futures price = $F = \$68,000$;

current 6-month T.Bill Rate = $r = 6\%$; and the yield curve is flat.

Suppose that total transactions costs = \$200, for a complete arbitrage with one contract.

A. If no coupon is paid on this bond during the next six months:

- (4) (i) What is the theoretical futures price?
- (6) (ii) Discuss specific arbitrage opportunities.

B. Now suppose a coupon is paid on this bond in 6 months, just prior to expiration of the forward contract. The present value of this coupon payment is \$900.

- (4) (i) What is the theoretical futures price?
- (6) (ii) Discuss specific arbitrage opportunities.

C. Consider again the situation in A. above (no coupon during the next six months).

Suppose that, on day 1, you buy one T. Bond futures contract with $K = \$68,000$.

Then, after 3 months the spot price increases to $S = \$67,500$,

while the yield curve remains flat at 6%.

- (4) (i) What is the new theoretical futures price?
- (6) (ii) What is the value of your futures contract?