Econ 174 Financial Insurance — Fall 2000
Allan Timmerman — UCSD

Your name and Student ID:

Midterm exam

Please answer all questions. The weight of each question is given next to the question number.

1. (30%) Explain the reasons why you **agree** or **disagree** with the following statements. Circle the correct answer and complete the sentence.

i. If professors allowed students to insure themselves against poor performance in midterm exams at UCSD, this would lead to an overall better exam performance.

Agree / Disagree because

ii. The graph relating the futures prices of a stock index to the time to expiration must always slope upwards.

Agree / Disagree because

iii. If reverse cash and carry is not possible, then the futures price of a consumption commodity, F, must satisfy the relation

$$F > S_0 \exp((u + r)T),$$

where S_0 is the current spot price of the commodity, u is the storage cost, r is the risk-free rate and T is the time to expiration.

Agree / disagree, because

iv. A financial hedge is not guaranteed to benefit the hedger financially. Its main purpose is to offset an existing exposure to risk.

Agree / disagree, because

2. (25%) A company needs to buy 1 million gallons of heating oil in May 2001. The current futures price for this expiration date is \$0.8190 per gallon, while the current spot price is \$0.9602. Each futures contract is for 42,000 gallons of oil.

i. Suppose that the correlation between changes in futures and spot prices is 0.98. How many futures contracts should the company trade to set up a hedge? Should it use a long or a short hedge?

ii. Now suppose that, in fact, in May 2001 the spot price of heating oil is \$0.7800 per gallon. How much did the company profit/lose on its futures position?

iii. If the cost of carry is 1% for oil and the current interest rate is 6% per annum, what is the convenience yield on oil between now and May 2001? What does it measure?

3. **(25%)** On October 17, 2000 the $ per yen exchange rate in the spot and forward markets were as follows:

Spot	0.009358
Sept 01	0.009784

Each forward contract is for 12.5 million yen.

i. Which was highest on this date, the U.S. or the Japanese interest rate?

ii. Assuming that the U.S. interest rate is 6% per annum for a loan expiring in September 01, what would be the Japanese interest ate for this period?

iii. Now suppose that the U.S. and Japanese interest rates are in fact identical (for loans expiring in September 01). How would you set up an investment strategy that is guaranteed to earn an arbitrage profit?

4. **(20%)** An investor sets up a *short* position in gold futures on September 19,2000 when the price is $280 per ounce. Each contract covers 100 ounces of gold. The initial margin is $1400 and the maintenance margin is $1,050.

Fill out the margin account, funds withdrawn and margin call for the following 5 days:

Date	Gold Price	Margin account	Funds withdrawn	Margin calls
9/20	280			
9/21	279			
9/22	285			
9/25	284			
9/26	288			