

Midterm Mock Exam

Monday, Oct 29, 2018

Instructions:

Carefully read these instructions! Failure to follow them may lead to deductions from your grade.

- Please write your name and student ID number on the front page.
- The exam lasts 120 minutes. It consists of four parts. Please answer all of them.
- You are allowed one “ $8\frac{1}{2} \times 11$ ” sheets of formulas and one calculator.
- Answer these questions without consulting anyone.
- Use the space provided. If more space is needed, use the two extra pages provided at the end of the exam.
- Be neat and show your work. Answers without work receive no credit. Wrong answers with partially correct work may receive partial credit.
- All pages of your exam paper (including the last two empty pages) should be turned in. Your grade will be deducted by 2 points per page missing.
- **You also need to turn in your cheat sheet.**

Good luck!!

Name: _____

HKUST ID: _____

Section Num: _____

FINA 3203 Exam Grade Sheet

1.	_____	/	20
2.	_____	/	20
3.	_____	/	20
4.	_____	/	40
Total	_____	/	100

1 (20 points) Short Questions

(Please briefly explain your answers.)

- (i) (5 points) Explain briefly the role of the “initial margin” and the “maintenance margin” in the “mark-to-market” procedure in the futures market.

- (ii) (5 points) On 10/12/2012, the December Euro FX Futures are traded at the price $F = 1.2938$ USD/EUR. At the same time, the spot exchange rate between the Euro and the Dollar is $M = 1.2957$ USD/EUR. Does the fact that $F < M$ suggest that the market expects the Euro to depreciate against the dollar in the next two months?

(iii) (5 points) Explain what is a currency carry trade.

(iv) (5 points) Explain the intuition behind the derivation of the put-call parity.

2 (20 points) Forwards

A stock is expected to pay a dividend of \$1.5 per share each month in the next 6 months. The current spot stock price is \$120 per share, and the annualized continuously compounded risk-free rate is 4.5%. An investor has just taken a short position in a 12-month forward contract on the stock.

- (i) (5 points) What is the present value of dividends? What is the initial value of the forward contract?

- (ii) (15 points) Six months later after the last dividend is paid, the spot stock price is \$115 per share and the risk-free rate remains at 4.5%. What is the value of the short position in the original forward contract? You need to show clearly how to use the replicating portfolio approach to derive the value, instead of using the formula directly.

3 (20 points) Futures

The December Eurodollar futures contract is quoted as 98.40 and a company plans to borrow \$8 million for three months starting in December at LIBOR plus 0.5%.

- (i) (4 points) What rate can the company lock in by using the Eurodollar futures contract?
- (ii) (10 points) What position should the company take in Eurodollar futures contracts to hedge the interest rate risk? Explain clearly what happens when LIBOR rates increase or decrease 3 months.
- (iii) (6 points) What position should the company take if it wants to hedge the interest rate risk using FRAs? Explain why.

4 (40 points) Swaps

Suppose that some time ago a financial institution agreed to receive 1-year LIBOR and pay 3% per annum on a notional principal of \$100 million. Payments are exchanged every year. The swap has a remaining life of 2.5 years. The annualized LIBOR rates for 6-month, 18-month, and 30-month maturities are 2.8%, 3.2%, and 3.4%, respectively. The 1-year LIBOR rate at the last payment date was 2.9%. (All interest rates quoted above are simple interest rates)

- (i) (10 points) The 1-year LIBOR rate for 6-month is 2.8%. The 1-year LIBOR rate at the last payment date was 2.9%. Which LIBOR rate should we use when calculating the forward rates, $f_{0,6\text{mth},18\text{mth}}$? Which LIBOR rate should we use when calculating the floating payment in 6 months?

- (ii) (10 points) Calculate the continuously compounded forward rates $f_{0,6\text{mth},18\text{mth}}$ and $f_{0,18\text{mth},30\text{mth}}$. What are the corresponding FRA rates, $r_{\text{FRA},6\text{mth},18\text{mth}}$ and $r_{\text{FRA},18\text{mth},30\text{mth}}$?

- (iii) (20 points) Calculate the current value of the swap. Clearly explain and write down the payoff of each component in your portfolio.

