

FM 5111  
Hw3

Chapter 10:

Questions: 7, 8, 11.

Chapter 11:

Questions: 3, 6.

In addition:

6) Consider Taylor's formula up to order 1 ( $f(x+h) \approx f(x) + hf'(x)$ ) applied to  $\log(1+h)$ . (We are taking  $x = 1$ ).

a) Replace  $h$  by the discrete return of a certain asset  $S$ .

(In other words:  $h = \frac{S_i - S_{i-1}}{S_{i-1}}$ )

b) Conclude that the discrete return is the first order approximation of the log return ( $\log(S_i/S_{i-1})$ ).

7) Suppose that the 6-month semiannual compounded rate is 1%.

1. How much would you pay today to receive  $100(1 + \frac{.01}{2})$  in 6 months?
2. How much would you pay today to receive  $100 \frac{.01}{2}$  in 6 months and  $100(1 + \frac{R(.5,1)}{2})$  in 1 year, where  $R(.5,1)$  is the 6-month semiannual compounded rate in 6 months?
3. How much would you pay today to receive  $100 \frac{r_6}{2}$  every 6 months (where  $r_6$  has been fixed at the beginning of each 6-month period, just like before) for 10 years and at the end you receive also \$100 (the principal)?

8) Financial institution pays 6-month Libor and receives 8% per annum with semiannual compounding on \$100,000,000.

The swap has a remaining life of 1.25 years.

The Libor rates for 3-month, 9-month and 15-month are 10%, 10.5% and 11%. The 6-month Libor 3 months ago was 10.2%.

What is the value of the swap?