Problem Set 3: Floaters, Inverse Floaters, Swaps

1) Today, time 0, a newly issued (zero cost) 1-year semi-annual pay plain vanilla interest rate swap has a swap rate of 8%. The time 0.5 cash flow to the counterparty who is short $100 notional amount of the swap is $1.00. *Assume there are no swap spreads.*

a) What is the 1-year par rate?

b) What is the 0.5-year zero rate?

c) What is the price of $1 par of a 1-year zero?

d) What is the value of $100 par of a 1-year semi-annual pay inverse floating rate note that pays 16% minus floating?

2) a) Suppose the 0.5-year zero rate is 6% and the 1-year zero rate is 8%. Consider a 1-year, plain vanilla, semi-annual pay, fixed-for-floating interest rate swap.

i) What is the swap rate that will make this swap worth zero?

ii) What is the dollar duration of $100 notional amount of this zero-cost swap?

b) Your liabilities have a market value of $100,000 and a duration of 3. Your assets have a market value of $100,000 and a duration of 5. Determine the notional amount of a position in the swap from part (a) that you require to immunize your net position against parallel shifts in interest rates. Ignore convexity.