

QF605 Fixed-Income Securities

Assignment 1, Due Date: 1-Feb-2023

1. Suppose we observe the following spot LIBOR rates:

LIBOR	Rate
1m	1.25%
2m	1.50%
3m	1.65%
6m	1.75%
12m	1.80%

The market is uncollateralized.

- (a) What forward rate would you show for a 9×12 FRA?
 - (b) Calculate the 1y par swap rate for an interest rate swap with quarterly payment.
 - (c) Calculate the continuously compounded zero rates $R(0, 3m)$, $R(0, 6m)$, and $R(0, 12m)$.
2. Suppose the spot exchange rate for USD/SGD is 1.42, and the USD 6m LIBOR rate is 1.5%. If the 6m forward exchange rate for USD/SGD is 1.39, calculate the implied 6m interest rate (SOR) in SGD using these instruments.
3. Suppose you observe the following instruments in the swap market:

Instrument	Quote
6m LIBOR	1.5%
1y IRS	1.8%
2y IRS	2.0%
3y IRS	2.05%

The market is uncollateralized, and all interest rate swaps (IRS) have semi-annual payment.

- (a) What is the 1.5y tenor interest rate swap with semi-annual payment?
- (b) A forward starting swap with a 2y tenor starting at $t = 1y$ has the following cashflows:

Time (y)	Pay	Rec
1.5	Par Swap Rate	6m LIBOR
2.0	Par Swap Rate	6m LIBOR
2.5	Par Swap Rate	6m LIBOR
3.0	Par Swap Rate	6m LIBOR

What is the par swap rate for this forward starting swap?