QF605 Fixed-Income Securities
Assignment 1, Due Date: 31-Jan-2024

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?