

# 4th Homework Report

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(a) (b) (c)

forward rate	
0Y_1Y	0.0282
1Y_2Y	0.0325
2Y_3Y	0.0323
3Y_4Y	0.0317
4Y_5Y	0.0315
5Y_7Y	0.0319
7Y_10Y	0.0328
10Y_30Y	0.0322

For every  $a < b$  belongs to  $[1, 2, 3, 4, 5, 7, 10, 30]$ ,  $\text{swap}_b$  is between  $\text{swap}_a$  and  $f_{a,b}$ .

(d)

Swap rate of a 15Y swap = 0.0322

(e)

spot rate	
1Y	0.0282
2Y	0.0304
3Y	0.0310
4Y	0.0312
5Y	0.0313
7Y	0.0314
10Y	0.0318
30Y	0.0321

Basically the same, while discount factors are slightly less than swap rate. I think it's because the swap pays twice every year.

(f)

new swap rates	
1Y	0.0386
2Y	0.0408
3Y	0.0414
4Y	0.0416
5Y	0.0417
7Y	0.0419
10Y	0.0423
30Y	0.0426

Yes, swap rates are shifted up about 100 basis points directly.

(g)

swap rates 1

1Y	0.0284
2Y	0.0306
3Y	0.0312
4Y	0.0319
5Y	0.0325
7Y	0.0332
10Y	0.0346
30Y	0.0374

(h)

forward rate 1

0Y_1Y	0.0282
1Y_2Y	0.0325
2Y_3Y	0.0323
3Y_4Y	0.0337
4Y_5Y	0.0344
5Y_7Y	0.0346
7Y_10Y	0.0375
10Y_30Y	0.0384

Only the back part of forward rate increased and became more steep.

(i)

swap rates 2

1Y	0.0234
2Y	0.0281
3Y	0.0298
4Y	0.0304
5Y	0.0310
7Y	0.0317
10Y	0.0321
30Y	0.0324

(j)

forward rate 2	
0Y_1Y	0.0233
1Y_2Y	0.0325
2Y_3Y	0.0328
3Y_4Y	0.0322
4Y_5Y	0.0330
5Y_7Y	0.0331
7Y_10Y	0.0328
10Y_30Y	0.0322

The 0Y\_1Y forward rate decreased a lot, while the middle part increased a little bit ,and the last part remained stable.

