International Financial Markets

1st take home assignment

Due date: April 12th, 2017

Exercise n.1

Consider the quotations below.

#	*Start Date*	*End Date*	*Price*	*Face Value*
1)	0	1m	99	100
2)	0	3m	97	100
3)	0	6m	95.2	100
4)	1m	3m		100
5)	1m	6m		100
6)	3m	6m		100

a) Compute the spot rates s(0,1m), s(0,3m), s(0,6m).
b) Compute the prices of the three forward contracts.
c) Show that the price of the forward contract in 6) cannot be 92.

Exercise n.2

Compute the future values and the present values of the following cash flow streams.

$$(-2, 96, 23, -15, -2, 65 \mid 0, 1, 2, 3, 4, 5)$$

$$(-1, -5, 44, -30, 265, -20 \mid 0, 1, 2, 3, 4, 5)$$

Compute the Future Values (t=5) and Present Values (t=0) using simple, compound and continuous rate of 5%, and supposing that the interest rate remains constant over time.

Exercise n.3

Check if the quotations below offer any possibility of risk-free arbitrage. If yes, show all the strategies useful to get positive cash flows without bearing any risk.

a) s(0,1) = 1.10%
b) s(0,4) = 1.50%
c) f(1,2) = 1.15%
d) f(2,3) = 1.08%
e) f(3,4) = 1.20%

Exercise n.4 *(max. 5 lines each answer)*

a) A positively sloped term structure of interest rates may happen, even though usually it is negatively sloped. True/False/Uncertain. Explain
b) Through the income gap analysis one can estimate the effects of an increase/decrease in the interest rates on the bank's value. Therefore, it must always be preferred to the duration gap analysis. True/False/Uncertain. Explain
c) The incentive fee serves to stimulate the distributor to sell mutual funds shares, while the management fee pays the asset manager/investment company. True/False/Uncertain. Explain
d) All else equal, the greater the duration of the bond the lower its riskiness. True/False/Uncertain. Explain
e) In exchange of lower transaction costs and strictly positive returns, mutual funds offer investors lower levels of diversification. True/False/Uncertain. Explain

Exercise n.5

Suppose that on financial markets you observe the coupon bonds 1 and 2, both with 5 years to maturity and…:

$$P_1 = €98; \quad C_1 = €5; \quad FV_1 = 100;$$
$$P_2 = €100; C_2 = €5; \quad FV_2 = 103$$

Using the information above exposed, compute the spot rate s(0,5y).

Exercise n.6

Consider the following bonds:

	1	2	3
Time to maturity	10 years	10 years	10 years
Type	Coupon Bond	ZCB	Coupon Bond
Coupon rate	3%	-	6%
Coupon frequency	half-yearly	-	Yearly
Face Value	1000	1000	1000

Suppose that the interest rate is constantly equal to 4.2%.

a) Which is the price of each bond?
b) Compute, and briefly comment, the duration of each bond.
c) Which is the price variation occurring to the three bonds if the interest rate grows up to 4.5%? (compute the exact price percentage variations and compare them with their approximations computable with the duration)

Exercise n.7

Suppose that you buy a coupon bond with 2 years to maturity, Price: 100, Face value:100 and coupon rate=5%.

a) Compute the expected return of the bond.
b) Suppose that in a year (t=1) you want to sell the bond and the market rate is 2.5%, due to changes in the interest rate level. Which is the realized return? Briefly comment why they differ from the expected one computed in a).

Exercise n.8

You own a €1000 zero coupon bond that has six years of remaining maturity. You plan on selling this bond in one year and believe that the required yield next year will have the following probability distribution:

Probability	Required Yield (%)
0.1	6.70
0.2	6.85
0.3	7.10
0.2	7.30
0.1	7.55
0.1	7.75

a) what is the expected price of the bond at the time of the sale?
b) what is the standard deviation of the bond price?