SCHOOL OF ECONOMICS AND MANAGEMENT

Financial Investment and Pricing

December 2016

Full Exam

90 minutes

Matricola ……………

Family Name ……………

First Name …………....

**QUESTION 1 Zero Coupon Bonds (5 points).**

Assume a Zero Coupon Bond (ZCB) with a face value = 100 EUR and a maturity = 5 years. Further assume a Yield to Maturity of 3%.

Compute the price of the bond. Use annually compounding. Assume value date today (no settlement days).

**Question 2 Coupon Bond (5 points)**

Consider the following bond:

3% Government bond, annual coupon

Maturity 1 August 2018

Today is the 5th November

Next coupon will be paid on 1st of August 2017 (269 days from today) and last coupon was paid on 1st of August 2016 (96 days ago).

Calculate the dirty and clean price of the bond assuming a Yield to Maturity 4% per annum.

Assume no settlement days.

**Question 3 (Primary, Coupon Bond)**

You work for the Treasury Ministry and you are in charge of calculating the price at which to offer a three years new bond to be issued today.

The bond will pay a 4% coupon every year and will be repaid at par after three years.

The Spot Rates for Government Bond are

1y 2%

2y 2.5%

3Y 3%

4Y 3.5%

5Y 3.75%

**QUESTION 4 (bootstrapping)**

You know that the spot (0,1) rate is equal to 2%

You know that a 2 year coupon bond paying a coupon of 3 in one year and repaying 103 in two years is currently trading at 102.

Calculate the spot (0,2) rate

**Question 5 (Forward Rates)**

Given the spot interest rates (S):

S(0,1) = 3,0%

S(0,2) = 4,0%

S(0,3) = 4,1%

S(0,4) = 4,2%

S(0,5) = 4,4%

Calculate the following forward rates:

FW(1,2)

FW(3,4)

FW(1,5)

**Question 6 (Long Bond, Annuity)**

The Republic of Italy is issuing a 20 years, 3% annual coupon bond. The Treasury announced that the bond will have a yield to maturity of 3.5%.

Calculate the price of the bond at issuance.

**Question A**

The company BuyorSellMe is a US company and has announced a dividend of USD10, saying it will pursue a dividend growth policy of 3% per year in line with OCSE expected growth.

The current YTM of the 10 year T-Bond government bond is equal to 2%

The beta of the stock is equal to 1.2

The estimated market premium is equal to 5%

Evaluate the price per share using the Dividend Discount Model (Gordon)

The current market price for the stock is 206 usd per share. Is the stock fairly valued?

This morning OCSE modified the expected growth rate of the US economy which is now 2,5%. Everything else being equal do you expect a change of the price of the share? What is the price you would expect?

**Question B**

The company FollowMe has announced a capital increase of 1 new shares every 5 existing shares at a price of 20 euro per new shares.

Before the capital increase the market capitalization of the company is 300 million euro, and there are 10 million shares outstanding.

Calculate:

* the theoretical ex right price (TERP) of the share and
* the theoretical value of the right.

After the launch of the capital increase the right is trading at 2 euro and the share (ex right) is trading at 29 euro.

Would you buy the share or the right? Why?. Show your calculation

**Question C**

Your portfolio is the following

You bought 1 share of company A at 80 euro per share

You bought a 1 put option with strike price 60 euro per share, expiration date 1 of March 2015 for which you paid 10 euro.

What will be your profit (or loss) -excluding the cost of the put - on 1st March 2015 (at expiration) if the price of the stock is 100, 90, 80, 60, or 50 euro?

Draw a diagram excluding the premium paid

What did you achieve by buying a put? What was your view on the stock?

*Please select the choice that best answers the question*

1. **The forward prices for financial instruments, such as equities, are an indicator of market expectations on where the price will move.**
2. True
3. False
4. Sometimes
5. True if interest rates are positive
6. **The spot price of a commodity is always lower than the price of the future on that commodity.**
7. True
8. False
9. Only if interest rates are negative
10. Only if interest rates are positive
11. **When futures prices of a given commodity are in backwardation**
12. Spot prices are lower than long dated future prices
13. Long dated futures prices are very volatile
14. Spot prices are higher than long dated futures prices
15. None of the above
16. **The Sharpe Ratio is**
17. The slope of the capital market line
18. The slope of the security market line
19. The beta of a stock
20. The name of a Bank
21. **In the context of portfolio management the Efficient Frontier is:**
22. The set of portfolios with optimal risk return ratio
23. The name of next course I want to take
24. The set of portfolios with the minimum variance
25. Another way to call the tangency portfolio
26. **When a stock has a beta of 1.9 is:**
27. More risky than the market
28. More risky then a stock with beta equal to 0.6
29. Less risky than a stock with beta equal to 0.6
30. None of the above
31. A and B
32. **If you think a stock has a positive Alfa you:**
33. Think the stock is overpriced, potentially sell the stock
34. Think the stock is underpriced, potentially buy the stock
35. Think the stock is fairly priced
36. A and C
37. **If the risk free rate is equal to 2% and the expected market return is equal to 8%:**
38. The market premium is 10%
39. The market premium is 6%
40. The Beta of any given stock is 1.1
41. The Alfa of the index is positive
42. **The expected return of a portfolio is equal to:**
43. The average of the returns of its components
44. The weighted average of the betas of the component
45. The weighted average of the returns of its components
46. The average of the returns of its component multiplied by the beta of the portfolio
47. **Assuming two portfolios have the same expected returns but different standard deviation, which portfolio would you prefer between the two?**
48. The one with higher Standard Deviation
49. The one with lower Standard Deviation
50. The portfolio with the smallest number of components
51. The one with lower Sharpe Ratio
52. **In order to minimize the risk in your portfolio the best strategy is**
53. Buy only bonds
54. Buy the tangency portfolio
55. Buy a portfolio with Sharpe Ratio equal to one
56. Buy the minimum variance portfolio
57. **The beta of stock FIP is equal to 1,2, the risk free rate is equal to 2% and the market premium is 4% . The expected return of stock Fip according to the Capital Asset Pricing Model is**
58. 8,6%
59. 6,8%
60. 6%
61. 3,2%