

VU Project and Enterprise Financing

330.214

Exam 1: 12.4.2016

Working period: 70 Minutes (⇒ 35 Points)

NOTES:

- Open book.
- Allowed are: (small) pocket calculators, lecture notes, student's notes, formularies, other hard copies
- Not allowed are: Notebooks (allowed only for viewing the lecture notes), tablets, mobiles and smart phones, internet connections
- All sheets (questions, solutions) have to be provided at the end of the exam!
- Pay attention of a readable handwriting!
- The following parts/possibilities will not be assessed: (a) unreadable parts, (b) canceled parts, (c) several alternative solutions (when only one solution is correct), and (d) a solution without comprehensible calculations!
- Use a ball pen instead of pencils.

Matriculation Number (Matrikelnummer): _____

Study Code (Studienkennzahl): _____

Family Name (Familiennamen): _____

First Name (Vorname): _____

(in BLOCK LETTERS)

Points:

Question 1: _____

Question 2: _____

Question 3: _____

Question 4: _____

Total: _____

Question 1 (5 Points)

The following prices are observable on the bond market:

	Maturity (in years)	Price	Nominal value
Zero bond 901	1	96.5	100
Zero bond 1055	2	91.7	100
Zero bond 754	3	88.0	100
Zero bond 209	4	83.8	100
Zero bond 443	5	79.0	100

Calculate the Forward Rate for the one year period $t = 2$ to $t = 3$ years (BEY). Round to 4 decimal places (in %), like, e.g. 7.9473%.

Question 2 (7 Points)

An Austrian government bond has a maturity of 1.5 years and a coupon of 5%. The following spot rates are observable:

Maturity (months)	3	6	9	12	18	24	36	48	60
Spot rate (% p.a.)	3.7	3.9	4.2	4.4	4.6	4.75	4.9	5.0	5.1

(a) Calculate the fair value (present value) of the Austrian government bond by using the MMY custom for cash flows with a maturity of less than one year, and BEY otherwise.

(b) Calculate the price the bond should have on the market (i.e. the traded (market) price).

Round to 4 decimal places, like, e.g., 107.9803%.

Question 3 (10 Points)

Value an interest rate swap with a nominal value of €1 Mio. and a maturity of 1.5 years from the viewpoint of the receive fix position. The swap rate is 4% p.a. and the variable interest rate is updated annually to the 12M Euribor rate. At the last adjustment date the 12M Euribor rate has been fixed at 3.4%. Use the following spot rates to value the swap (BEY):

Maturity (months)	3	6	9	12	18	24	36	48	60
Spot rate (% p.a.)	3.8	4.0	4.3	4.4	4.6	4.75	4.9	5.0	5.1

Round currency values to 2 decimal places, like, e.g., €715.34.

Question 4 (13 Points)

A portfolio consists of the following 2 bonds:

- Zero bond: Nominal value = 15 Mio EUR, maturity = 7 years
- Coupon bond: Nominal value = 5 Mio EUR, coupon = 8%, maturity = 3 years

Current market interest rate: 5% p.a., flat term structure

(a) Calculate the interest rate sensitivity (Duration and Modified Duration) of the portfolio?

(b) Calculate the change in market value (in €) of the portfolio caused by a parallel shift of the interest rate term structure by +100 basis points (i) approximately (by assuming a linear relationship between rate and market value changes), and (ii) exact?

Round currency values to 2 decimal places, like, e.g., €715.34. Round Duration values to 4 decimal places, like, e.g., 6.9803.