721957S FUNDAMENTALS OF FINANCE 06.11.2014

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All the answers on these sheets only!

Allowed material:
– calculator of any kind
– one sheet of student's own notes

1. A fixed-coupon bond is paying annual coupons of 50 euros. The next coupon payment is to take place one year from now, and the time-to-maturity of the bond is five years. The face value of the bond is 1000 euros, and the current market price of the bond is 916.58 euros.

a) Show that the continuously compounded yield-to-maturity of the bond is 6.8%.

b) Calculate the duration of the bond.

2. An interest rate swap is paying 3.425% fixed swap rate annually over the remaining time-to-maturity of three years and nine months. Correspondingly, the floating-leg of the swap pays semiannually with a reference to the six-month Euribor rate. The nominal principal (face value) of the swap is 10 million euros. The next fixed-leg payment of the swap is to take place nine months from now, whereas the next floating-leg payment is to take place three months from now. The rate to be applied in the next floating-leg payment was reset three months ago, and is 2.250%. With the current interest rates, the continuously compounded yield-to-maturity of the swap's fixed-leg is 3.275%. The current three-month and six-month Euribor rates are 2.125% and 2.255%, respectively.

a) Determine the value of the swap from the point of view of the fixed rate payer.

b) Calculate the durations of the both legs of the swap, and determine, how much the swap value changes, if interest rates rise by 0.5 percentage units in terms of continuous compounding.

3. Determine the stock price after an equity rearrangement separately in each of the following three cases. Assume that the value of the firm does not change in any other respect. The stock trades currently at 18 euros.

a) A stock split of 1:2 takes place.

b) A stock dividend of 5:1 takes place.

c) A share issue of 10:2 takes place, at the issue price of 15 euros.

4. The performance of a portfolio of 25 stocks is evaluated over a six-year period of monthly data, the total number of monthly return observations being 72. The *annualized* mean excess return and excess return standard deviation of the portfolio are 10% and 16%, respectively.

a) Calculate the Sharpe's ratio of the portfolio.

b) Caclulate the t-statistic for the null-hypothesis that the ratio does not differ from zero.

5. The attached tables include the latest income statement and the balance sheets of MBA Corporation. Also, the projected income statements, capital investment budget, and net working capital budget over the period 2015-2018 are provided. In the projections, it is assumed that the *Net Sales*, *Costs of goods sold*, *Depreciation*, and *Capital expenditures* are to grow at a 10% annual rate over a two-year period 2015-2016. Thereafter the growth rate is expected to stabilize at a constant level of 5%. Regarding working capital requirement, the projections assume that 10% of annual *Net sales* appear in the balance sheet in terms of current assets. Similarly, 10% of annual *Costs of goods sold* appear as current liabilities. The required rate of return on assets of the MBA Corporation is estimated on the basis of an approximated unlevered beta, and is found to be 8.5% in terms of annual compounding.

a) Calculate the unlevered free cash flows for years 2015-2018. Apply 35% corporate tax-rate.

b) Calculate the present value of all future unlevered free cash flows.

Income statement	**2014**
Net sales	1010
Costs of goods sold	650
Deprecation	200
Earnings before interest and taxes	160
Interest paid	60
Taxes	35
Net income	65

Balance sheet	**2013**	**2014**
Current assets		
Cash	200	200
Other current assets	92	101
Fixed assets	1600	1650
Current liabilities	59	65
Long-term debt	850	880
Retained earnings	183	206
Stockholders' equity	800	800

Budget	**2015**	**2016**	**2017**	**2018**
Net sales	1111.00	1222.10	1283.21	1347.37
Costs of goods sold	715.00	786.50	825.83	867.12
Depreciation	220.00	242.00	254.10	266.81
Earnings before interest and taxes	176.00	193.60	203.28	213.44
Capital expenditures	275.00	302.50	317.63	333.51
Change in Net working capital	3.60	3.96	2.18	2.29