

# **EXAMINATION I**

**Economics**

**Corporate Finance**

**Financial Accounting and Financial  
Statement Analysis**

**Equity Valuation and Analysis**

**Questions**

**Final examination**

**September 2014**

**Question 1: Economics**

**(37 points)**

In April 2013, the central bank of Japan (Bank Of Japan) decided on a policy of further monetary easing. Under this policy, the Bank regulates financial markets to increase the monetary base at a pace of approximately 60 trillion to 70 trillion yen per year. The Bank of Japan expects this to result in a monetary base of 270 trillion yen at the end of 2014, roughly doubling it from the end of 2012. Japan's nominal GDP (2012) is approximately 476 trillion yen.

The ultimate objective of the Bank of Japan is to make a bold increase in the monetary base while at the same time setting an explicit inflation target of 2% in its monetary policy. This is expected to increase private sector inflationary expectations and cause consumer prices to rise to levels near the target so that "achievement takes place as quickly as possible over a period of roughly 2 years."

- a)
  - a1) Define the term "monetary base". (2 points)
  - a2) List 3 representative mechanisms that a central bank might use in order to increase the monetary base. (6 points)
  - a3) Describe the relationship between monetary base and money supply. Assume that the economy is in a normal state. Explain the credit creation function of banks referring to private-sector economic activities. (6 points)
- b)
  - b1) In ordinary circumstances, what impact does an increase in the monetary base have on economic activities? Use the IS-LM model to graph your answer, and provide an explanation. Assume that no other conditions have changed and a closed economy. (6 points)



- b2) Assuming trade with other countries and free financial transactions, explain with reference to the IS-LM model framework used in b1), the impact that an increase in the monetary base will have on economic activities. (5 points)
- b3) Until April 2013, the Bank of Japan has repeatedly moved official interest rates to virtually zero percent while at the same time making large injections to the monetary base. Use the IS-LM model to graph the reasons why this monetary policy had no effect, and explain your answer. (8 points)



- c) Investors expect that the Bank of Japan's inflation target policy will gradually be realised and that an inflation rate of 2% will be fully achieved in 5 years. In this situation, what is the short-term interest rate expected in 5 years (expressed as a percentage)? To answer, explain the Fisher equation and assume that it holds true both currently and in 5 years' time, but do not change the real interest rate from 1% and assume all other conditions to be static. (4 points)

**Question 2: Financial Accounting and Financial Statement Analysis****(52 points)**

Jonny Boss is the Chief Financial Officer of ABC Inc, a fast growing industrial conglomerate. Jonny Boss is concerned about the company's increasing debt-to-equity ratio.

The condensed consolidated statement of financial position of ABC Inc. as of 31.12.N1, prepared according to IFRS, is shown below (figures in thousand CU (Currency Units)).

<b>Consolidated Statement of financial position of ABC Inc. as of 31.12.N1</b>			
Noncurrent Assets	210,000	Shareholders' Equity	40,000
Current Assets	70,000	Noncurrent Liabilities	130,000
		Current Liabilities	110,000
Total	280,000	Total	280,000

- a) Calculate the total-debt-to-equity ratio of the ABC Inc. as of 31.12.N1. (2 points)
- b) For the forthcoming fiscal year N2, ABC Inc. plans to invest a total of 100 million CU in new equipment. For the purpose of financing these investments, ABC's local bank is willing to grant a long-term loan amounting to 100 million CU on the terms and conditions set out below:
- Payment amount: 98% on 01.01.N2
  - Redemption amount: 100% on 31.12.N5
  - Nominal interest rate: 4% p.a.
  - Interest payment dates: annually on 31.12.
  - Effective interest rate: 4.56% p.a.

[Note: ABC Inc. is measuring its financial liabilities at amortized cost using the effective interest method.]

Assuming that, apart from the effects of the bank loan, net income of year N2 will be nil, what impact does the borrowing have, neglecting any tax effects, on the debt-to-equity ratio of ABC Inc. based on the consolidated statement of financial position as of 01.01.N2 and as of 31.12.N2, respectively (answer with supporting calculations)? (10 points)

- c) As an alternative to loan financing, Jonny Boss considers issuing a convertible bond amounting to 100 million CU on the terms and conditions set out below:
- Par value: 100% on 01.01.N2
  - Redemption amount: 100% on 31.12.N5
  - Conversion right: 2 shares of ABC Inc. in return for 1 bond with a nominal amount of 100 CU on 31.12.N2
  - Nominal interest rate: 2% p.a.
  - Interest payment dates: on 31.12. each year

A similar bond without a conversion right could be issued at an effective interest rate of 4% p.a.

Assuming that, apart from the effects of the convertible bond issuance, net income of year N2 will be nil, and neglecting any taxes, what impact does the issue of the convertible bond have on the debt-to-equity ratio of ABC Inc. based on the consolidated statement of financial position as of 01.01.N2 and as of 31.12.N2, respectively (answer with supporting calculations)? (12 points)

- d) As an alternative to purchasing capital equipment, Jonny Boss considers entering into finance lease agreements starting on 01.01.N2 with average lease terms of five years. Based on the received offers from several lessors, Jonny Boss estimates the overall lease expenses as amounting to 24 million CU p.a., which would be payable annually. The effective interest rate of the lease agreements is 6.4% p.a. on a total fair market value of 100 million CU for all lease agreements.

Assuming, again, that, apart from the effects of the finance lease agreements, net income of year N2 will be nil, and neglecting any taxes, what impact does the use of finance lease contracts have on the debt-to-equity ratio of ABC Inc. based on the consolidated statement of financial position as of 01.01.N2 and as of 31.12.N2, respectively (provide supporting calculations)? (8 points)

- e) ABC Inc. is currently negotiating with strategic investors the acquisition of a controlling interest in the competitor C. In the board of directors two strategies are discussed:
- Strategy 1: Takeover of all shares in C at an acquisition price of 50 million CU.
  - Strategy 2: Acquisition of a 60% stake in C at an acquisition price of 35 million CU.

The acquisition costs are to be financed completely through borrowing. In both cases, the deal will take place on 01.01.N2.

As a result of a due diligence, ABC has obtained the following information concerning the business of C:

- |                              |                |
|------------------------------|----------------|
| • Book value of assets:      | 160 million CU |
| • Book value of liabilities: | 130 million CU |
| • Fair value of assets       | 180 million CU |
| • Income tax rate:           | 25%            |
| • Market capitalisation:     | 48 million CU  |

The fair value of C's liabilities does not differ from the book value. Take into account the impact of deferred taxes when you answer the following questions.

- e1) What impact does the takeover of all shares in C (strategy 1) have on the debt-to-equity ratio of ABC Inc. based on the consolidated statement of financial position as of 01.01.N2 (provide supporting calculations)? (7 points)

- e2) What impact does the acquisition of a 60% stake in C (strategy 1) have on the debt-to-equity ratio of ABC Inc. according to the consolidated statement of financial position as of 01.01.N2? IFRS 3 'Business Combinations' gives entities the choice to measure non-controlling interests (minority interest) at the fair value of their proportion of identifiable assets and liabilities or at full fair value. The two choices are also called the 'partial goodwill'-method and the 'full goodwill'-method. Calculate the impact on the debt-to-equity ratio of each method. (13 points)

**Question 3: Corporate Finance / Equity valuation and analysis****(46 points)**

Beauty Alliance is a manufacturer of personal care products – soap, shampoo, shaving cream, sunscreen, and the like. At a board meeting, John Deep, the founder and CEO of Beauty Alliance, has been considering a proposal developed by its strategic team. It calls for investing EUR 60 million to enter the cosmetics business and create a new unit that specializes in naturally-oriented make-up. Mark Van Hausen, head of the team proposing the project, argues that the company already spent EUR 2 million in research and development expenses and a further EUR 1 million for marketing research and all the results look very promising.

However the expansion is not without significant risk. The cosmetics business is a totally new business line for Beauty Alliance. What is more, Beauty Alliance is a small company, while most competitors in the make-up business are large and established firms. And on top of that, the new project will be financed entirely with debt and will thus increase the company's leverage, which causes some concerns to Mr. Deep.

a) The investment proposal is based on the following data and estimates.

The length of the project is 6 years. The initial investment in factory and equipment is estimated at EUR 60 million. It is assumed that their salvage value at the end of the project will be nil. The annual depreciation expense for the factory and the equipment is based on a straight line method over the life of the project.

For simplicity, it is assumed that the net working capital (NWC) will amount to 10% of revenues and the entire amount of the NWC will also be recovered at the end of the 7<sup>th</sup> year. Table 1 provides revenues and operating costs expected from the project over the six years. The corporate tax rate is 30%.

**Table 1: Forecasted revenues and operating costs for the cosmetic project (million EUR)**

<b>Year</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
Revenues		80.0	86.4	93.3	100.8	108.8	117.5
Operating costs and expenses		-33.6	-36.3	-39.2	-42.3	-45.7	-49.4

a1) Should research and development expenses of EUR 2 million and marketing expenses of EUR 1 million be included in the project valuation? Explain your answer. (3 points)

a2) Compute the annual free cash flows (FCF) expected from the project. Use the table below. You may not need all the rows. Show your calculations. (13 points)

Year	0	1	2	3	4	5	6	7

b) The investment decision-making policy at Beauty Alliance requires the calculation of the net present value (NPV) of the project using as the discount rate the company’s after-tax WACC. Mark Van Hausen argues that the use of the company’s WACC introduces a bias in the valuation as the project presents different risks to those previously encountered by the company. Therefore, he is advocating the use of a risk-adjusted discount rate for the calculation of the project's NPV.

[Note: Base your answers on a 'real world'-situation with taxes, agency costs, bankruptcy costs and other costs.]

b1) Do you agree with Mr. Van Hausen’s argument? Explain your answer. (7 points)

Mr. Van Hausen has estimated equity betas as well as the debt-to-equity ratios for a set of comparable companies that specialize in the new project’s line of business (Table 2). The target debt-to-equity ratio of the project will be 1. The risk free rate is 3%. The market risk premium is 4%. The cost of debt is 5%.

**Table 2: Equity betas and D/E for comparable firms**

Company	Equity beta	D/E
A	1.3	0.6
B	1.15	0.3
C	0.95	0.1
D	1.12	0.4



- b2) Compute the asset beta for the project [hint: take the average equity beta for the comparables and assume a debt beta of zero]. (5 points)
- b3) Estimate the WACC for the project. (6 points)
- c) John Deep has received a proposal by a local authority that is willing to grant a loan of EUR 10 million at a below-market interest rate, provided that the factory will be built in a depressed area in the region. Beauty Alliance will pay 3.5% p.a. (instead of 5% p.a.) for a 6-year loan. The principal is to be repaid in equal installments over the life of the loan.
- c1) Calculate the present value (PV) of the subsidized loan. Ignore any tax effects. [Hint: Calculate the cash flow streams for each year, and discount them using the market cost of debt, i.e. 5%.] (7 points)
- c2) Calculate the difference – if any – between the face value and the present value of the loan. Provide an economic interpretation of your result. (5 points)

**Question 4: Equity valuation and analysis****(45 points)**

Consider two companies, X and Y, whose stocks are currently traded on the same market. Some data about companies X and Y have been collected. These data can be seen in table 1 below.

**Table 1**

Company	X	Y
Earnings per share in financial year ended June 30 <sup>th</sup> 2014 (in Euro)	1.6	0.9
Pay-out ratio	0.6	0.5
Expected constant dividend growth rate	3.0%	5.0%
Beta	1.1	1.4
Return on Equity (ROE)	4.0%	7.0%

The risk-free rate of return is assumed to be equal to 2.0% while the expected market rate of return is 5.0%. All above data are assumed to be constant in the future, unless stated otherwise. Dividends are paid each year on June 30<sup>th</sup>.

- a)
- a1) Determine the sustainable rate of growth of companies X and Y. (3 points)
  - a2) Using these growth rates, determine, using the standard Dividend Discount Model (DDM), the 2014 ex-dividend (i.e. immediately after the payment of the dividend) stock prices of companies X and Y. As discount rate, use that derived from the Capital Asset Pricing Model (CAPM). (9 points)
- b)
- b1) The DDM encompasses the company's rate of growth. Discuss what happens if the rate of growth is negative. Does the model provide reliable prices in this case? Explain. (5 points)
  - b2) Can a sustainable rate of growth be negative? Explain your answer. (4 points)
- c)
- c1) Assume the rate of growth of company X will be, in the future, constant and equal to minus 5.0%. What will be its dividend per share in 2024? (2 points)
  - c2) Assume now that company X's dividend will grow at a rate minus 5.0% for the next two years. After this period dividends will grow at the growth rate reported in Table 1. What will be the ex-dividend stock price of company X on July 1<sup>st</sup> 2014? (7 points)

- d) To answer the following questions use the data in table 1, including the expected dividend growth rates contained there.
- d1) An investor is planning to buy a stock of company X on July 1<sup>st</sup>, 2014 and to sell it right after the company pays its 2016 dividend (i.e. on July 1<sup>st</sup>, 2016). Considering also dividends paid during the holding period, calculate the internal rate of return (IRR) of this investment. (11 points)
- d2) Compare the IRR obtained above with the rate of return determined by CAPM for company X. Is the IRR equal to greater than or smaller than the CAPM derived rate of return. Explain your answer. (4 points)