EXAMINATION I

Economics

Corporate Finance

Financial Accounting and Financial Statement Analysis

Equity Valuation and Analysis

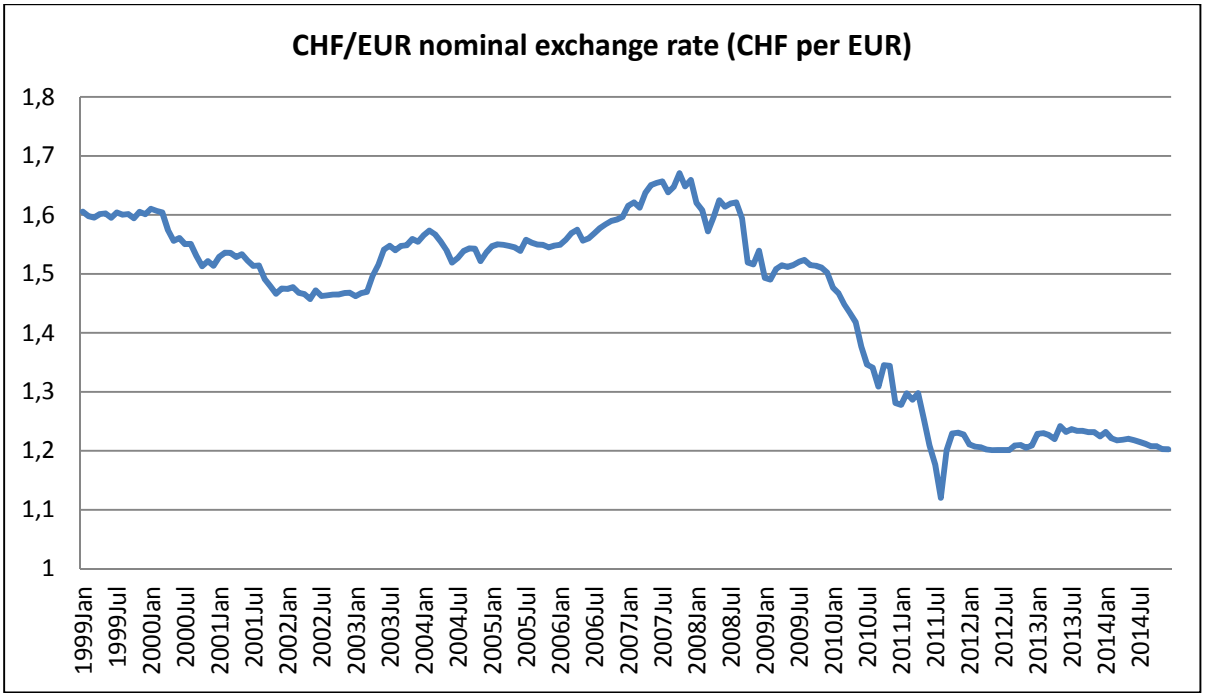
Questions

Final examination

September 2015

Question 1: Economics **(35 points)**

The following graph shows the evolution of the nominal exchange rate of the Swiss Franc (CHF) against the Euro (EUR) from January 1999 through December 2014.



CHF/EUR nominal exchange rate (CHF per EUR) - Source: European Central Bank

a) Between October 2007 and August 2011, the CHF/EUR nominal exchange rate decreased by 33%, i.e. the Swiss Franc experienced a strong nominal appreciation vis-à-vis the Euro. Explain how the inflation rate (the consumer price index - CPI) in the Euro zone and in Switzerland should have evolved in that time period according to the theory of relative purchasing power parity (PPP). (4 points)

b) Many empirical studies indicate that PPP does not hold in the short run, but that it holds in the long run. Provide a theoretical explanation for this finding. (4 points)

c) Between October 2007 and August 2011 the Swiss cumulated inflation rate was 1.6% while the Euro zone inflation rate was 7.1%. How did the CHF/EUR **real exchange rate** evolve in that time span? Also use the data from a) above. (5 points)

d) Which condition has to be satisfied for a country's net exports to decrease as a result of a real exchange rate appreciation? Assume that the net exports are almost zero. Provide a detailed answer. (8 points)

e) To avert the nominal appreciation, the central bank of Switzerland – the Swiss National Bank (SNB) – heavily intervened in foreign-exchange markets. Describe how

interventions that aim at averting a nominal appreciation affect the monetary base in the intervening country. (4 points)

f) Explain how a central bank can use sterilized interventions to influence the exchange rate without allowing for such an effect on the monetary base as in e). (4 points)

g) In September 2011, the SNB announced that it would not allow the Swiss Franc to appreciate beyond 1.20 CHF/EUR. In January 2015, it abandoned this commitment.

Explain in detail why a central bank that is interested in conducting an autonomous monetary policy and that faces high international capital mobility cannot maintain a fixed exchange rate. (6 points)

Question 2: Financial Accounting and Financial Statement Analysis (56 points)

The following questions focus on some of the main principles of consolidated financial statements that Tom Newman, a recently hired assistant in the equity research department of QualityResearch Ltd, is expected to be able to understand.

[Note: The main questions (i.e. a) to c) are not related to each other, therefore they can be answered independently of one another. However, sub-questions within a main question (e.g. a1) and a2) are related to each other.]

All of the mentioned firms prepare their accounts in accordance with IFRS.

Disregard any tax effects.

a) Alpha Co owns the following investments in other companies:

	Equity shares held by Alpha Co
Chi Co	80%
Psi Co	30%
Omega Co	45%

Alpha Co also has appointed five of the seven members of the Omega Co's board of directors and is represented with one member on Psi Co's eight-member board of directors.

a1) Which of the investments are accounted for as subsidiaries in the consolidated accounts of Alpha Co Group? Explain your answer in a few words. (4 points)

a2) Alpha Co acquired its 30% stake in Psi Co on January 1st year N for a cash consideration of CU 600,000 (CU = Currency Unit). Table 1 shows Psi Co's statements of financial position at the date of acquisition and for the year ended December 31st year N. The latter includes trade payables to Alpha Co for CU 50,000. At the acquisition date the carrying values of Psi Co's assets and liabilities had been equal to their fair values.

On December 31st year N, the investment in Psi Co must be impaired by CU 200,000 because its recoverable amount is less than its carrying amount.

What are the effects of the acquisition of the 30% stake in Psi Co on Alpha Co Group's consolidated statement of financial position as of December 31st year N? After having answered the question, fill in – where appropriate – the blanks in Table 2. (8 points)

b) Just before year-end N Company Pink Co acquired 80% of the equity interests of Company Scarlett Co, a private entity, in exchange for cash of CU 150. The management of Pink Co measures the separately recognizable identifiable assets acquired and the liabilities assumed as of the acquisition date in accordance with the requirements of IFRS 3. The identifiable assets are measured at CU 250 and the liabilities assumed are measured at CU 50. Pink Co engages an independent consultant, who determines that the fair value of the 20% non-controlling interest in Scarlett Co is CU 42. Pink Co measures non-controlling interests at fair value (full goodwill method).

b1) Calculate the goodwill (or negative goodwill) arising on the acquisition of Scarlett Co. (4 points)

b2) How does Pink Co record its acquisition of Scarlett Co in its consolidated financial statements as of December 31st year N? To answer the question, fill in the blanks in Table 3. (8 points)

b3) Explain what is meant by "negative goodwill" (bargain purchase). And give 2 reasons that could be disclosed for a bargain purchase in acquisitions. (5 points)

c) On October 1st year N, Beta Co acquired 8 million shares of Sigma Co on the following terms: an immediate payment of CU 4.00 per share on October 1st year N; and a further amount of CU 5.4 million whose payment is deferred until October 1st year N+1. The time value of money is reflected using an annual interest rate of 8%.

The summarized statements of financial position of Beta Co and Sigma Co at September 30th year N+1 are shown in Table 4. The following information is also relevant here:

- Beta Co's policy is to value the non-controlling interest at fair value at the date of acquisition. For this purpose the directors of Beta Co considered a share price for Sigma Co of CU 3.50 per share to be appropriate.
- At the date of acquisition, the fair value of Sigma Co's property, plant and equipment was equal to its carrying amount with the exception of Sigma Co's plant that had a fair value of CU 4 million above its carrying amount. At that date the plant had a remaining life of four years. Sigma Co uses straight-line depreciation for plant assuming a nil residual value.
- Also at the date of acquisition, Beta Co valued Sigma Co's customer relationships as a customer base intangible asset at fair value of CU 3 million. Sigma has not accounted for this asset. Trading relationships with Sigma Co's customers last on average for six years.
- At September 30th year N+1, Sigma Co's inventory included goods bought from Beta Co (at cost to Sigma Co) of CU 2.6 million. Beta Co had marked up these goods by 30% on cost. Beta Co's agreed current account balance owed by Sigma Co at September 30th year N+1 was CU 1.3 million.
- Impairment tests were carried out on September 30th year N+1, which concluded that consolidated goodwill was not impaired.

c1) Determine Beta Co's stake in Sigma Co's equity, then calculate the goodwill arising on the acquisition of Sigma Co. The table below may help you. (10 points)

	CU ,000
Immediate cash consideration	……
Deferred consideration	……
Non-controlling interest	……
Issued capital	……
Pre-acquisition retained earnings	……
Fair value adjustments: - plant	……
- intangibles	……
Goodwill arising on acquisition	……

c2) Calculate unrealized profit (URP) in inventory / intra-group current accounts. (4 points)

c3) Calculate the post-acquisition adjusted profit of Sigma Co. Again, the table below may help you. (3 points)

Post-acquisition adjusted profit of Sigma Co	CU ,000
Profit as reported	……
Additional depreciation of property, plant and equipment (PPE)	……
Additional amortization of intangibles	……
	……

c4) Calculate consolidated retained earnings. (6 points)

Beta Co Group's consolidated retained earnings	CU ,000
Beta Co's retained earnings	……
Sigma Co's post-acquisition profits	……
URP in inventory	……
	……

c5) Calculate the non-controlling interest. (4 points)

	CU ,000
Fair value on acquisition	……
Post-acquisition profits	……
	……

Table 1

Psi Co		
Statement of financial position	**01.01.N**	**31.12.N**
	(in CU ,000)	(in CU ,000)
ASSETS		
Property, plant and equipment	800	815
Other assets	350	330
Total non-current assets	**1,150**	**1,145**
Inventories	250	245
Trade and other receivables	200	190
Cash and bank balances	150	220
Total current assets	**600**	**655**
Total assets	**1,750**	**1,800**
EQUITY AND LIABILITIES		
Issued capital and share premium	800	800
Other reserves	50	50
Retained earnings	250	350
Shareholders' equity	**1,100**	**1,200**
Borrowings	250	230
Provisions	50	60
Other liabilities	50	50
Total non-current liabilities	**350**	**340**
Trade and other payables	150	140
Borrowings	100	60
Other liabilities	50	60
Total current liabilities	**300**	**260**
Total equity and liabilities	**1,750**	**1,800**

Table 2

Alpha Co Group	
Effects of acquisition of 30% stake in Psi on the consolidated statement of financial position	**31st December year N**
	(in CU ,000)
ASSETS	
Property, plant and equipment	
Goodwill	
Investments in associates	
Deferred tax assets	
Other assets	
Total non-current assets	
Inventories	
Trade and other receivables	
Other assets	
Cash and bank balances	
Total current assets	
Total assets	
EQUITY AND LIABILITIES	
Issued capital and share premium	
Other reserves	
Retained earnings	
Equity attributable to owners of the company	
Non-controlling interests	
Borrowings	
Deferred tax liabilities	
Provisions	
Other liabilities	
Total non-current liabilities	
Trade and other payables	
Borrowings	
Other liabilities	
Total current liabilities	
Total equity and liabilities	

Table 3

Pink Co Group	
Consolidated Statement of financial position at 31st December year N	
	+ / - (in CU ,000)
ASSETS	
Cash and bank balances	…….
Goodwill	…….
Other non-current and current assets	…….
Total assets	…….
EQUITY AND LIABILITIES	
Equity attributable to owners of the company	…….
Non-controlling interests	…….
Non-current liabilities and current liabilities	…….
Total equity and liabilities	…….

Table 4

Statement of financial position at September 30th yearN+1	**Beta Co**	**Sigma Co**
	(in CU ,000)	(in CU ,000)
ASSETS		
Property, plant and equipment	50,000	31,000
Intangible assets	7,500	
Investment in Sigma Co	37,000	nil
Total non-current assets	**94,500**	**31,000**
Inventories	11,200	8,400
Trade and other receivables	7,400	4,800
Cash and bank balances	3,400	500
Total current assets	**22,000**	**13,700**
Total assets	**116,500**	**44,700**
EQUITY AND LIABILITIES		
Issued capital (shares of CU 1 each)	50,000	10,000
Retained earnings - at 1 October N	25,700	12,000
Net income of year ended 30 September N+1	8,800	6,000
Shareholders' equity	**84,500**	**28,000**
Borrowings	3,000	1,500
Provisions	5,000	1,000
Other liabilities	7,000	5,500
Total non-current liabilities	**15,000**	**8,000**
Trade and other payables	7,500	6,200
Deferred consideration (for the acquisition of Sigma Co)	5,400	
Borrowings	2,100	2,000
Other liabilities	2,000	500
Total current liabilities	**17,000**	**8,700**
Total equity and liabilities	**116,500**	**44,700**

Question 3: Corporate Finance **(35 points)**

Expansion Co. faces three mutually exclusive investment projects A, B, and C. These projects have different lives. The projects A and B generate free cash flows (FCFs) for six years each, whereas project C earns free cash flows during four years. The expected future annual after tax free cash flows as well as the initial investment costs at date t = 0 are given in the below table:

t	FCF(A)	FCF(B)	FCF(C)
0	-3,000	-1,900	-3,000
1	800	1,300	900
2	1,000	1,300	1,000
3	1,300	1,300	1,400
4	1,400	1,300	5,000
5	2,500	1,300	
6	3,000	1,300	

An investment in either project does not affect the systematic risk of Expansion Co.'s assets. That is, the projects have the same systematic risk as the overall systematic risk of the assets in place. Currently, Expansion Co. is a mixed debt-equity financed company with a debt-to-total assets ratio equal to 40% and the company will apply this capital structure when financing the new projects. Expansion Co. is taxed at a rate of 25%. The pre-tax costs of debt amount to 4% p.a. The annual risk free rate of return equals 1% p.a. The market risk premium is 10% p.a. and the equity beta of Expansion Co. is 1.6.

a) Determine the weighted average cost of capital (WACC) of Expansion Co. Show your calculations. (5 points)

b) Assume that the chief financial officer (CFO) solely has to choose among the projects A and B. For which investment project should the CFO opt? Substantiate your answer on grounds of shareholder value maximization. [Note: If you failed in determining the WACC in part a) use 11.4% as the appropriate discount rate.] (8 points)

c) Immediately before the CFO chooses between project A or project B, a massive capital restructuring is effected in order to pay out an immediate extra dividend to the shareholders of Expansion Co. Even though the new capital structure increases the leverage to a debt-to-equity ratio of 2, Expansion Co.'s pre-tax cost of debt remains unaffected. Determine the weighted average cost of capital that the CFO should use in capital budgeting after the capital restructuring? (12 points)

d) Expansion Co.'s investment horizon has a length of 12 years. Assume that the chief financial officer solely has to choose among the projects A and C under the current capital structure (see question a)). Matching the investment horizon is achieved by reinvestment in the same project at the end of the life of the respective investment project. For which investment project should the CFO opt? Substantiate your answer on grounds of shareholder value maximization. [Note: If you failed in determining the WACC in part a) use 11.4% as the appropriate discount rate.] (10 points)

Question 4: Equity valuation and analysis **(38 points)**

Anna, a portfolio manager, is interested in estimating the current share value of International Fan Company (IFC) and in determining its worthiness for inclusion in her fund. IFC's financial data from its Year N annual report are provided in Tables 1 and 2. In addition, Anna has collected the following information from a variety of sources:

3-month Treasury bill yield	1.5% p.a.
Expected return on a broad stock market portfolio	8.0% p.a.
IFC's equity beta	1.10
IFC's average pre-tax cost of debt	7.8% p.a.
Target weight on debt in IFC's capital structure	30%
Target weight on common equity in IFC's capital structure	70%
IFC's marginal tax rate	40%

Anna expects IFC to maintain its payout ratio for the next 3 years.

IFC's earnings and dividends are expected to grow at the current sustainable growth rate for the next 3 years; that is, during N+1, N+2, and N+3. After three years, the growth rate is expected to stabilize at a long-term annual rate of 5%. IFC pays its dividend on the last day of the year.

Anna would like to use several analytical measures for her analysis.

Table 1

International Fan Company Income Statement for the year ended December 31, year N (in USD thousands, except per-share data)	
Sales	297,200
Cost of goods sold	(170,800)
Gross profit	126,400
Selling, general, and administrative expenses	(57,900)
Earnings before interest taxes depreciation and amortization (EBITDA)	68,500
Depreciation and amortization	(11,500)
Earnings before interest and taxes	57,000
Interest expenses	(15,400)
Income before taxes	41,600
Income taxes	(9,500)
Net income	32,100
Number of shares outstanding (in thousands)	9,304
Dividend distributed in year N	12,840
Stock price at the end of year N	33.50

Table 2

International Fan Company
Balance sheet on December 31, year N
(in USD thousands)

Current Assets	
Cash and cash equivalents	12,200
Trade accounts receivable	55,000
Inventories	36,000
Other current assets	29,900
Total current assets	133,100
Other Assets	
Property, plant, and equipment	190,000
Less: Accumulated depreciation	(46,400)
Net property, plant, and equipment	143,600
Other noncurrent assets	77,100
Total noncurrent assets	220,700
Total assets	353,800
Current Liabilities	
Short-term debt	9,600
Trade accounts payable	51,200
Other current liabilities	11,800
Total current liabilities	72,600
Long-term Liabilities	
Long-term debt	82,200
Other noncurrent liabilities	30,500
Total noncurrent liabilities	112,700
Total liabilities	185,300
Shareholder equity	
Common equity	38,700
Retained earnings	129,800
Total equity	168,500
Total liabilities and equity	353,800

a) As a first step, compute the three components of ROE in the DuPont System for year N. Also, compute IFC's sustainable growth rate. (7 points)

b) IFC is considering a number of proposals to alter its sustainable growth rate. Discuss the effect of each of the following proposals on the sustainable growth rate (no calculations necessary):

- Increase the dividend
- Announce a 2-for-1 stock split.
- Increase long-term debt by an additional bond issue to buy back some IFC stock.
- Cut administrative expenses to boost profits.

(6 points)

c) Calculate IFC's equity-holders' required rate of return. (4 points)

d) Calculate IFC's weighted average cost of capital (WACC). (4 points)

e) Using the dividend discount model (DDM), calculate the value of IFC stock at the beginning of year N+1. (11 points)

f) Anna recalls that her professor in her undergraduate statistics class often reminded students that "all models are incorrect, but some are useful." The constant growth dividend discount model (Gordon growth model) is a useful model for stock valuation, but its use is fraught with problems. Discuss two strengths and two weaknesses of the model. (6 points)

Question 5: Equity valuation and analysis **(16 points)**

a) The model for the valuation of a stock held for a single-period has four variables, that are defined below: V_0, D_1, P_1, and k_s. Calculate the missing variable in the table below for the four stocks using the information on the other variables provided below.

Stock	Estimated Value (V_0)	Expected Dividend (D_1)	Expected Price (P_1)	Required Rate of Return (k_s)
A	①	2.0	56.00	8.0%
B	40.00	1.6	②	7.0%
C	85.00	③	90.00	8.5%
D	54.56	2.20	60.00	④

(8 points)

b) Timothy wants to estimate the justified price-to-earnings multiple (P/E ratio) for Howard Petrochemicals. He has collected the following information and would like to use the Gordon Growth model to determine it.

Risk-free rate	1.6%
Expected return on a broadly based market portfolio	7.2%
Howard Petrochemichals	
Earnings per share (EPS) for the current year	USD 2.2
Dividend per share for the current year	USD 0.88
Dividend growth rate (constant)	5.2%
Beta	1.10

Calculate the justified leading price-to-earnings (P_0/E_1) ratio for Howard. (8 points)