

EXAMINATION I

Economics

Corporate Finance

**Financial Accounting and Financial
Statement Analysis**

Equity Valuation and Analysis

Questions

Final examination

March 2019

Question 1: Economics

(22 points)

Over the past five years, the exchange rate between the USD and the EUR has been fluctuating in a relatively wide range. The EUR was quoted as high as 1.39 and as low as 1.05 USD. One currency forecaster was recently quoted as saying “I expect the currency pair to return to parity soon,” while other experts expect a significant weakening of the USD. In order to assess the likelihood of such predictions, it may be most useful to combine a number of different theoretical approaches and see whether they give rise to a uniform view with regard to future developments.

Recently the exchange rate between the EUR and the USD was quoted as follows:

- Spot rate: 1 EUR = 1.160 USD

- 1-year forward rate: 1 EUR = 1.199 USD

- a) Based on these values, what can be said about nominal one-year interest rates in the US and the Eurozone? (3 points)
- b) At the same time, inflation expectations for the coming 12 months stand at 3% in the US and at 1.8% in the Eurozone. What is the theoretical value of the exchange rate USD per EUR in one year based on relative purchasing power parity theory? (3 points)
- c) An analyst claims that based on the theory of absolute purchasing power parity, the USD is undervalued at the current level. Provide a verbal definition of “absolute purchasing power parity” and explain what is meant by the fact that based on that theory, the USD is undervalued. (4 points)
- d) What development in the real exchange rate is needed to move the USD from “undervalued” to “fairly valued” based on the theory of purchasing power parity? What are the different two possibilities of getting to this new equilibrium? (4 points)
- e) The monetary approach of the exchange rate is another popular model of exchange rate determination. Describe the factors that determine the exchange rate in that model. Also make sure to describe the adjustment mechanism assumed in the model. (8 points)

Question 2: Economics

(18 points)

The Canadian economy is blessed with a wealth of mining resources, but also leverages advanced technology in its booming automobile and machinery industries. In addition, Canada is stabilized by the NAFTA (North American Free Trade Agreement), which gives it favourable terms of trade with the US. Nonetheless, the outlook is not necessarily optimistic. Recent years have seen a stubbornly high unemployment rate, while the United States, the destination for resource exports, has made progress in developing its own shale gas resources. Even in industrial products, there is a greater tendency towards protectionism in the United States that could undermine the Canadian economy. Historically, the Canadian government has reacted by diversifying trade, introducing more flexible fiscal management, and rethinking regulation. Answer the following questions in light of this information.

- a) At the end of September 2016, the interest rate for 3-month Canadian Department of Finance securities (TB3M) were at 0.51%, the interest rate for 3-month US treasuries (TB3M) were at 0.29% and the spot foreign exchange rate was 1.313 Canadian dollars against the US dollar. When the spot exchange rate moved to 1.343 Canadian dollars against the US dollar 3 months later, evaluate the change in the 3 months of the spot foreign exchange rate compared to the uncovered interest rate parity. (6 points)
- b) Answer the following questions applying the AD-AS framework to the Canadian economy.
- b1) Briefly explain the AD-AS model by using a graph. (4 points)
- b2) Use a graph to briefly explain the impact of a restrictive fiscal policy in terms of the AD-AS model over the short run. (4 points)
- b3) Use a graph to briefly explain the impact on the output and the prices of the economy of a rise in productivity due to deregulation in terms of the AD-AS model. (4 points)

Question 3: Financial Accounting and Financial Statement Analysis (56 points)

Company P is a Japan-domiciled enterprise with worldwide operations. Company P prepares its consolidated financial statements according to International Financial Reporting Standards IFRS. Answer the following questions.

a) (18 points)

Company P established a subsidiary (Company S) in the United States several years ago. Company S's functional currency is US dollars (USD). Below are its financial statements for this year.

Table a-1 Company S balance sheet (all amounts in thousand units)

Item	Amount presented in USD	Amount presented in JPY
Cash and deposits	7,200	
Accounts receivable-trade	10,800	
Inventory assets	13,300	
Tangible fixed assets	29,000	
Total Asset	60,300	(1)
Accounts payable-trade	9,000	
Long-term debt	19,800	
Common stock	25,000	(2)
Retained earnings	6,500	(3)
Translation differences	—	(4)
Total Equity and Liabilities	60,300	

Table a-2 Company S profit and loss statement (all amounts in thousand units)

Item	Amount presented in USD	Amount presented in JPY
Sales	72,000	(5)
Cost of sales	61,200	
Depreciation expenses	3,800	(6)
Other expenses	4,500	
Net income	2,500	(7)

Table a-3 Company S statement of changes in equity (changes in retained earnings)
(all amounts in thousand units)

Item	Amount presented in USD	Amount presented in JPY
Retained earnings balance at beginning of period	4,800	
Net income	2,500	
Dividend	800	(8)
Retained earnings balance at end of period	6,500	

Translate Company S's financial statements into Japanese yen (JPY) and fill in the blanks marked (1) - (8). Below are the foreign exchange rates to be used in translation and other matters of note.

Exchange rate when Company S was established (there has been no capital increase since then)	100 JPY/USD
Exchange rate at the date of dividend declaration	112 JPY/USD
Exchange rate at the end of the period	115 JPY/USD
Average exchange rate of the period	110 JPY/USD

Note 1:

To simplify, assume that revenues and expenses of Company S are translated into the presentation currency using the average exchange rate of the period.

Note 2:

The amount presented in JPY for the retained earnings balance at the end of the previous period was JPY 518,000 thousand.

b)

(13 points)

Company P acquired 80% of Company T's shares for JPY 591,300 million in cash, and included the company into its consolidated subsidiary. Table b-1 contains the book and fair values of Company T's assets and liabilities as of the date of business combination (acquisition date). Note that Company P measures non-controlling interests at the non-controlling interests' proportionate share of the acquiree's (subsidiary T's) identifiable net assets.

Table b-1 Company T's assets and liabilities on the date of the acquisition (Unit: 1 million yen)

	Fair value	Book value
Cash and cash equivalents	6,500	6,500
Accounts receivable	36,960	36,960
Total liquid assets	43,460	43,460
Tangible fixed assets	105,600	55,600
Intangible assets	378,940	308,940
Total non-liquid assets	484,540	364,540
Total assets	528,000	408,000
Accounts payable	55,400	55,400
Others	21,100	21,100
Total liquid liabilities	76,500	76,500
Total non-liquid liabilities	81,900	81,900
Total liabilities	158,400	158,400

The income tax rate of Company T is 25%.

As a result of this business combination, how much will each of the following Company P's consolidated balance sheet items (consolidated balance sheet directly after business combination) increase or decrease? Mark increases with a plus sign (+) and decreases with a minus sign (-) before the amount. If there is no change, mark the item with a zero (0).

- b1) Cash and cash equivalents. (2 points)
- b2) Intangible assets (identifiable intangible assets). (1 point)
- b3) Non-controlling interests (see the introductory note under b). (4 points)
- b4) Goodwill. (4 points)
- b5) Capital. (2 points)

c)

(25 points)

Company P owns 70% of Company U's issued and outstanding shares. Company U still is a public listed company and prepares its financial statements according to International Financial Reporting Standards IFRS. Its summarised financial statements for the year ended 28 February 2019 and the comparative figures for the year ended 28 February 2018 are shown below.

Prepare the statement of cash flows for the year ended 28 February 2019 for Company U in accordance with the indirect method in accordance with IAS 7 Statement of Cash Flows. (Determine the value of the items marked with capital letters A – Q in Table c-3. You may use Table c-4 for the calculation of some of the requested items.)

Table c-1 Statement of financial position

	28 February 2019	28 February 2018
	CU '000	CU '000
Assets		
Property, plant and equipment	48,000	36,000
Goodwill	7,500	7,500
Intangible assets	3,000	2,000
Equity investments, at cost	2,500	0
Non-current assets	61,000	45,500
Inventories	17,500	11,500
Trade and other receivables	22,000	16,500
Cash and cash equivalents	7,500	10,000
Current assets	47,000	38,000
Total assets	108,000	83,500
Equity		
Share capital and share premium	27,000	22,500
Revaluation reserves	2,000	
Retained earnings	25,000	19,500
Total equity	54,000	42,000
Liabilities		
Loans and borrowings	20,500	12,500
Non-current liabilities	20,500	12,500
Current tax liabilities	3,500	2,500
Loans and borrowings	9,500	8,500
Trade and other payables	20,500	18,000
Current liabilities	33,500	29,000
Total liabilities	54,000	41,500
Total equity and liabilities	108,000	83,500

Table c-2 Statement of profit or loss and other comprehensive income

	For the year ended 28 February	
	2019	2018
	CU '000	CU '000
Revenue	60,500	49,500
Cost of sales	-33,500	-28,000
Gross profit	27,000	21,500
Selling and distribution expenses	-4,650	-3,750
Administrative expenses	-4,850	-4,250
Other expenses	-1,500	-1,000
Operating profit	16,000	12,500
Net finance costs	-1,050	-650
Profit before tax	14,950	11,850
Income tax expense	-4,450	-3,550
Profit for the period	10,500	8,300
Other comprehensive income		
Revaluation of property, plant and equipment	2,000	
Other comprehensive income for the period	2,000	0
Total comprehensive income for the period	12,500	8,300

The following information is relevant:

The depreciation and amortization expense for the year ended 28 February 2019 was:

	in CU '000
Property, plant and equipment	5,500
Intangible assets (manufacturing license)	1,250

There were no sales of non-current assets during the year.

Property has been revalued during the year.

New shares have been issued during the year.

Table c-3 Statement of cash flows for the year ended 28 February 2019

Cash flows from operating activities		in CU '000
Profit for the period		10,500
Adjustments for:		
Depreciation and amortization	A	
Net finance costs	B	
Tax expense	C	
<hr/>		
Changes in:		
Inventories	D	
Trade and other receivables	E	
Trade and other payables	F	
<hr/>		
Cash generated from operating activities	G	
Interest paid		-1,050
Income taxes paid	H	
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Net cash from operating activities	I	
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Cash flows from investing activities		
Acquisition of property, plant and equipment	J	
Acquisition of intangibles	K	
Acquisition of other investments	L	
<hr/>		
Net cash used in investing activities	M	
<hr/>		
Cash flow from financing activities		
Proceeds from issue of share capital	N	
Proceeds from loans and borrowings	O	
Dividends paid	P	
<hr/>		
Net cash from financing activities	Q	
<hr/>		
Net decrease in cash and cash equivalents		-2,500
Cash and cash equivalents at 1 March 2018		10,000
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Cash and cash equivalents at 28 February 2019		7,500

Table c-4 Auxiliary tables

(i) Income tax

Tax liability on 28.02.2018	
Income tax expense	
Income tax paid (= balance)	
Tax liability on 28.02.2019	

(ii) Property, plant and equipment

Amount on 28.02.2018	
Depreciation	
Revaluation	
Acquired during the year (= balance)	
Amount on 28.02.2019	

(iii) Intangible assets

Amount on 28.02.2018	
Amortization	
Acquired during the year (= balance)	
Amount on 28.02.2019	

(iv) Dividends paid

Retained earnings on 28.02.2018	
Profit for the year ended 2019	
Dividends paid (= balance)	
Retained earnings on 28.02.2019	

Question 4: Corporate Finance**(32 points)**

Carl Forge is a junior financial analyst at Black Locust LP, an activist investor. Activist investors are shareholders in publicly traded companies who usually seek to enforce a significant change in a company's strategy (like breaking up or merging groups, making acquisitions or divestments, improving operational efficiency), financial structure (capital allocation, capital structure), management or board composition.

Carl has been asked to prepare data for decision making on some existing and potential investment targets. Answer the following questions.

- a) The two firms ABC and XYZ operate independently and have the following financial parameters:

Financial parameters	Firm ABC (USD million)	Firm XYZ (USD million)
Revenues	5,000	2,500
Total costs and expenses	-4,000	-1,700
EBIT	1,000	800
Expected growth rate of EBIT (p.a.)	4.0%	6.0%
Cost of capital (WACC)	9.0%	10.0%

Both firms are in steady state, with capital spending offset by depreciation. There is no additional working capital required. Both firms are taxed at a 30% rate and have no debt outstanding.

Black Locust LP believes that a combination of the two firms (in a merger of equals) will create economies of scale and increase the combined firm's future growth.

- a1) Determine the firm value of ABC and XYZ, in the case of both companies operating independently. Use a discounted free cash flow model. (8 points)
- a2) Determine the weighted average cost of capital of the combined firm. Round your result to one decimal place. (3 points)
- a3) Black Locust LP estimates that economies of scale will allow the combined entity to reduce total costs and expenses to 73% of revenues. Furthermore, Black Locust estimates that a better market position of the combined firm will increase its future growth in revenues to 5.5% p.a. Based on these estimates, calculate the value of the combined firm, and the value of total synergies, all other parameters being equal. Fill in the blanks (A) ~ (E) in the following table. (7 points)

Financial parameters	Combined firm with no synergy (USD mn)	Combined firm with synergies (USD mn)
Revenues	7,500	7,500
Total costs and expenses	-5,700	(B)
EBIT	1,800	(C)
Expected growth rate of EBIT p.a.	5.0%	5.5%
Cost of capital (WACC)	a2)	a2)
Firm value	(A)	(D)
Value of synergies	-.-	(E)

- b) Santé SE is a French pharmaceutical and healthcare company. Respiro SE, a German company, is developing, producing and marketing inhalation devices. Both companies are publicly listed on their respective domestic stock exchanges and have no debt outstanding.

Black Locust LP holds a significant participation in Santé SE slightly exceeding 5% of the share-capital. Black Locust believes that Santé SE would generate added value for its shareholders by acquiring Respiro SE. The following data (see below table) have already been compiled by Black Locust's research department.

	Santé SE	Respiro SE
Current stock market price per share (in EUR)	70.5	14.0
Shares issued and outstanding (in mn)	10.0	30.0
Outstanding debt	0	0
Market capitalization (in EUR mn)	705.0	420.0

Black Locust believes that the acquisition will create cost and sales synergies. Its research department has determined – based on a discounted cash flow model – a fair equity value for the combined company of EUR 1,425 million.

- b1) What is the maximum price Santé SE should pay for Respiro SE in a cash deal based on the above data and estimates? In such a case, all the positive net present value of the synergies goes to the shareholders of Respiro SE. (3 points)

b2) With the aim (1) to protect its own interests as a significant shareholder of Santé SE and (2) the take-over offer to be attractive enough to be accepted by Respiro's shareholders, Black Locust intends to submit the following proposal to Santé's board of directors:

- Acquisition of Respiro SE by way of a share deal;
- the number of Santé shares to be newly issued shall be determined by the distribution of the net present value of synergies between the shareholders of Santé and Respiro;
- the net present value of expected synergies shall be equally shared between shareholders of Respiro and Santé.

- (i) What is the expected net present value of synergies? (1 point)
- (ii) Determine the number of Santé shares to be newly issued based on a fifty-fifty split of synergies' NPV between the shareholders of Santé and Respiro. (6 points)
- (iii) Determine the share exchange ratio. (2 points)
- (iv) After the transaction, what fraction of total issued Santé shares will be owned by the shareholders of Respiro? (2 points)

Question 5: Equity Valuation and Analysis

(52 points)

You are a junior financial analyst at CleverInvest, a fund management company specialised in equity investments. Your boss has asked you to perform a couple of valuation tasks on some potential investment cases. (The cases can be evaluated independently from each other.)

a) Case ‘Company CBA’

Company CBA has just paid an annual dividend in the amount of EUR 0.80 per share for the very recently closed last fiscal year. Earnings per share for the last fiscal year had been EUR 1.00. A regression analysis you performed on past returns for CBA’s stocks shows that its β is equal to 1.2.

The expected stock market rate of return is $E(r_M) = 0.07$ (7%), the risk-free interest rate is $r_F = 0.02$ (2%), and the current ex-dividend stock market price for CBA is $P = 20.8$.

- a1) Determine the market implied dividend growth rate g_{IMPL} for CBA. CleverInvest calculates cost of equity (COE) on the basis of the Capital Asset Pricing Model. Your boss recommended to use the Constant Dividend Growth Model (Gordon-Shapiro Model). (6 points)
- a2) After having analysed CBA’s financial statements of the last five years and having talked to CBA’s management team, your boss believes that the market implied growth rate obtained in a1) is wrong. He doesn’t think that the current market price is the fair value. According to your boss’ opinion, the company has a strong history of being a “cash cow” with limited chances, in the future, of growing at a such sustained rate. In his estimates the company will just be able to retain its average past years’ return on equity (ROE) of 10.0% while maintaining its current payout ratio.

Which dividend growth rate is implied in your boss’ estimates? (2 points)

- a3) Assuming that your boss’s estimates will be met by CBA, is it worth buying CBA’s stocks at their actual market price? Base your answer on the Constant Dividend Growth Model. Irrespective of your result in a2) above, calculate with a sustainable growth rate g of 2.5%. (3 points)

b) Case “Company FED”

Your boss asked you to prepare valuation data for an investment decision in Company FED's stock. You start your task with calculating Company FED's stock beta and required rate of return. In its past Company FED had USD 100 million in straight bonds outstanding, but has very recently redeemed the entire value and adopted a debt-free policy going forward. At the time when Company FED had the USD 100 million straight bonds outstanding, its stock beta was 1.25. Your boss believes that Company FED's stock beta changed as a result of the recent redemption of the straight bonds.

- b1) Using the following assumptions, calculate Company FED's stock beta after the redemption of the straight bonds.

- ✧ The debt-to-equity ratio based on Company FED's market value (interest-bearing debt/market capitalization) was constant at 0.1 when the straight bonds still were outstanding.
- ✧ Company FED's straight bond beta is zero.
- ✧ Company FED's corporate income tax rate is 30%.

(4 points)

- b2) Use the capital asset pricing model (CAPM) to calculate the required rate of return on Company FED's stock. In your calculation, assume the risk-free rate is 4%, and the expected rate of return on a market portfolio is 12%. (2 points)

When looking at Company FED's results, your boss assumes that, beginning this term and on into perpetuity, the return on equity (ROE; income /shareholders' equity at the beginning of the year) will be 14%, and the payout ratio 20%.

Your boss asked you to use the residual income model shown below to calculate Company FED's theoretical share price assuming that Company FED engages in no capital increases or other capital transactions and that the clean surplus relationship holds true.

Theoretical share price = book value per share at the beginning of the year + present value of residual income per share from this term onwards

- b3) Company FED's book value per share at the beginning of the year is USD 60. Calculate the expected residual income per share of this term. For this and subsequent problems assume that the required rate of return per stock is 13%. (5 points)
- b4) Company FED's current market share price is USD 85. Use the residual income model to calculate Company FED's theoretical share price and determine whether shares are trading at an undervalued, an overvalued, or reasonable price. (5 points)

Recently, some of Company FED's shareholders asked for an increase in dividends. Company FED's management team has announced that it is currently reviewing a potential increase of the payout ratio to 50% from this term.

- b5) Company FED has a stated policy of not issuing new stock or using debt. Increasing the payout ratio to 50% will therefore lower the amount invested in future business. The change in dividend policy could also have an impact on ROE from next term onwards. Your boss assumes that this year's ROE will be unchanged at the forecast of 14%, but he changes the forecasted ROE, from next term onwards to 12.0% p.a. Assuming that FED's payout ratio is raised to 50% from this term onwards, what will be the dividend per-share for this term and next term? Assume in your answer that the clean surplus relationship holds true. (4 points)
- b6) What is Company FED's theoretical share price based on the above assumptions? Use the dividend discount model. (4 points)
- b7) Compare your result from b6) with FED's book value per share of USD 60. Provide the reason why the theoretical share price is above/below book value. (4 points)

c) Case “Company IHG and MLK”

Your boss wonders how much of the theoretical value per share of Company IHG and Company MLK respectively can be attributed to both firms’ policy of investing in new projects from retained earnings. He provided you with the following information:

	Company IHG	Company MLK
EPS at the end of the first year	GBP 10	EUR 8
Dividend payout ratio	40%	70%
Required rate of return (r)	12%	10%
Return on retained earnings and future retained earnings (ROE)	15%	8%

If IHG were to distribute all its earnings, it could maintain a level dividend stream of GBP 10 per share; if MLK were to distribute all its earnings, it could maintain a level dividend stream of EUR 8 per share. (In such case, assume that the required rate of return r doesn’t change for both companies.)

For each of the two companies, calculate the value per share for its growth opportunities, i.e. the value per share that is solely based on the growth of the company. (13 points)

EXAMINATION I

Economics

Corporate Finance

**Financial Accounting and Financial
Statement Analysis**

Equity Valuation and Analysis

Solutions

Final examination

March 2019

Question 1: Economics**(22 points)**

a)

Since the EUR is strengthening (Forward relative to Spot), nominal one-year interest rates in the Eurozone must be lower than in the US according to the covered interest rate parity.

b)

Based on relative purchasing power parity, the expected exchange rate in one year is equal to $1.160 * 1.03 / 1.018 = 1.1737$.

(Using the same notation as Solution c), relative PPP is often approximately expressed by:

$$\frac{dP_t}{P_t} = \frac{dS_t}{S_t} + \frac{dP_t^F}{P_t^F}.$$

Hence, when $S_t = 1.160$, $dP_t/P_t = 0.03$, and $dP_t^F/P_t^F = 0.018$, the expected exchange rate in one year $S_t + dS_t = 1.160 + 1.160 * (0.03 - 0.018) = 1.17392$.)

c)

The law of absolute purchasing power parity states that the prices of representative baskets of goods and services in different countries must be the same when expressed in a common currency: $P_t = S_t \cdot P_t^F$

where:

P_t = domestic general price level at time t

S_t = nominal exchange rate (the price of the foreign currency dominated in the domestic currency) at time t

P_t^F = foreign general price level at time t.

To put it in a different way, PPP implies that the purchasing power of a currency should be the same in both countries.

An undervaluation of the USD in this context means that goods denominated in USD are cheaper than goods denominated in EUR, based on the current nominal exchange rate ($P_t < S_t * P_t^F$).

d)

The Requirement is an appreciation of the real exchange rate. This can be achieved either via an appreciation of the nominal exchange rate or via relatively higher inflation in the United States.

e)

The monetary approach to the exchange rate is a direct application of the purchasing power parity and the quantity theory of money. While the PPP concludes that the exchange rate is the relative price of goods in two countries, monetary theory suggests that the spot exchange rate (S) is the relative price of two currencies. The exchange rate should therefore reflect the evolution of the relative supplies and demands for the two currencies. The exchange rate is determined as a function of money supply, real income and interest rate.

As the domestic money supply increases, domestic currency depreciates proportionately. More money implies higher prices and, through PPP, the domestic currency depreciates. A shift in the foreign money supply has the opposite effect. The domestic currency appreciates in response to a rise in domestic real income because of the implied excess demand for money. Therefore, prices must decrease in order to restore equilibrium. A higher interest rate differential implies a decrease in the money demand which in turn causes prices to rise and the domestic currency to depreciate.

(The adjustment mechanism above assumed in the monetary approach to the exchange rate could be explained by combination of PPP and equilibria in the domestic and foreign money market such that

$$\begin{aligned}P &= S * P^F, \\ \frac{M}{P} &= L(Y, i), \\ \frac{M^F}{P^F} &= L^F(Y^F, i^F) .\end{aligned}$$

From these equations,

$$S = \frac{P}{P^F} = \frac{\frac{M}{L(Y,i)}}{\frac{M^F}{L^F(Y^F,i^F)}} .)$$

Question 2: Economics**(18 points)**

a)

$$\frac{S_{t+1}^e}{S_t} = \frac{1+i_t}{1+i_t^*}, \text{ Approximation: } i_t - i_t^* = \frac{(S_{t+1}^e - S_t)}{S_t}$$

Interest-rate gap is $0.51\% - 0.29\% = 0.22\%$ (per annum)

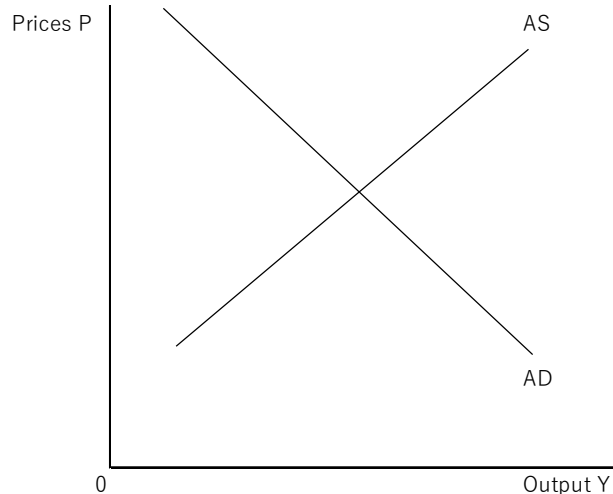
If uncovered interest rate parity holds true, the Canadian dollar will change (depreciate) by 0.055% over the quarter.

The actual rate of change (depreciation) for the Canadian dollar against the US dollar is $1.343/1.313 - 1 \approx 2.3\%$, which is so large that the uncovered interest rate parity hypothesis does not appear to apply.

b)

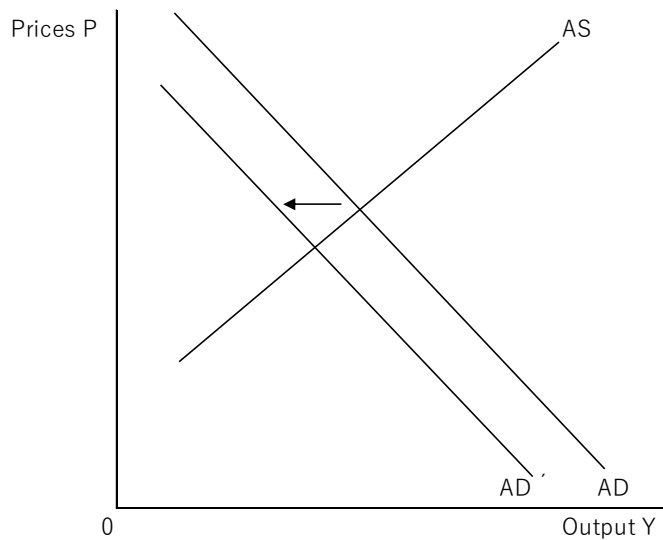
b1)

Macroeconomic equilibrium can be expressed in the AS-AD framework. The AD curve represents the link between the Prices level and the output of the economy due to the aggregate demand. The AS curve represents the relationship between the wages and the output of the economy due to the aggregate supply.



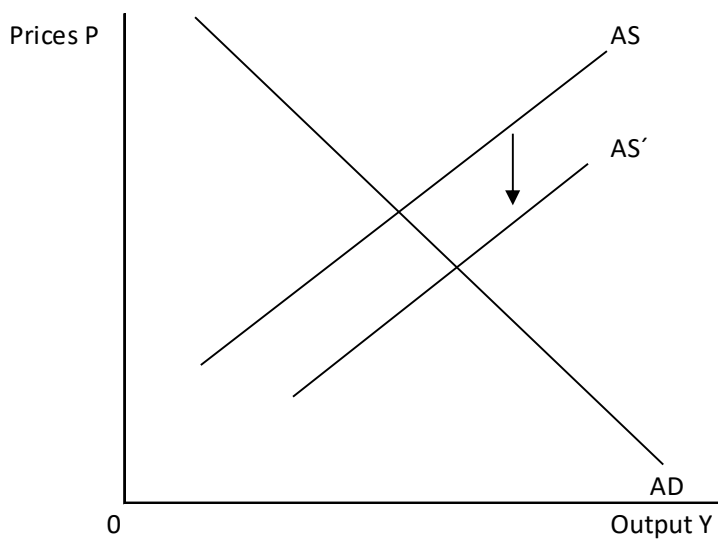
b2)

Under a tight fiscal policy, the AD curve shifts to the left (from AD to AD'), causing a reduce in Prices level P, and a decline in the output Y.



b3)

Government deregulation increases productivity and reduces costs, causing the AS curve to shift downward (from AS to AS'). This results in a decline in prices P and increase in output Y.



Question 3: Financial Accounting and Financial Statement Analysis (56 points)

a)

Company S balance sheet

Item	Amount presented in USD	Translation rate	Amount presented in JPY
Cash and deposits	7,200	115	828,000
Accounts receivable-trade	10,800	115	1,242,000
Inventory assets	13,300	115	1,529,500
Tangible fixed assets	29,000	115	3,335,000
Total Asset	60,300		(1) 6,934,500
Accounts payable-trade	9,000	115	1,035,000
Long-term borrowings	19,800	115	2,277,000
Common stock	25,000	100	(2) 2,500,000
Retained earnings	6,500		(3) 703,400
Translation differences	—		(4) 419,100
Total Equity and Liabilities	60,300		6,934,500

Company S profit and loss statement

Item	Amount presented in USD	Translation rate	Amount presented in JPY
Sales	72,000	110	(5) 7,920,000
Cost of sales	61,200	110	6,732,000
Depreciation expenses	3,800	110	(6) 418,000
Other expenses	4,500	110	495,000
Net income	2,500		(7) 275,000

Company S statement of changes in equity (changes in retained earnings)

Item	Amount presented in USD	Translation rate	Amount presented in JPY
Retained earnings balance at beginning of period	4,800		518,000
Net income	2,500	110	275,000
Dividend	800	112	(8) 89,600
Retained earnings balance at end of period	6,500		703,400

b)

b1)	Cash and cash equivalents	-584,800 million yen
b2)	Intangible assets	<u>+378,940 million yen</u>
b3)	Non-controlling interest	<u>+67,920 million yen</u>
b4)	Goodwill	<u>+319,620 million yen</u>
b5)	Capital	<u>0</u>

Explanation (unit: JPY 1 million)

b1)

Acquisition price + cash and cash equivalents acquired from Company T
= $-591,300 + 6,500 = -584,800$

b2)

Intangible assets acquired from Company T = 378,940

b3)

Fair value of identifiable net assets: $528,000 - 158,400 = 369,600$

- Book value of identifiable net assets: $408,000 - 158,400 = \underline{249,600}$

= Hidden appreciation of identifiable assets 120,000

Deferred taxes: $120,000 \times 25\% = 30,000$

Non-controlling interest: $20\% (369,600 - 30,000) = 67,920$

b4)

Acquisition price of P's interest 591,300

+ Non-controlling interest 67,920

= Fair value of Company T at acquisition date 659,220

- After tax fair value of identifiable net assets: $369,600 - 30,000 = \underline{339,600}$

= Goodwill 319,620

Other calculation: $591,300 - 80\% (369,600 - 30,000) = 319,620$

b5)

The amount of consideration for the business combination was paid entirely in cash, and there has been no change in company P's capital stock.

c)

Statement of cash flows

Cash flows from operating activities	Solution	Remarks
Profit for the period	10,500	
Adjustments for:		
Depreciation and amortization	A 6,750	
Net finance costs	B 1,050	
Tax expense	C 4,450	
	22,750	
Changes in:		
Inventories	D -6,000	=11500-17500
Trade and other receivables	E -5,500	=16500-22000
Trade and other payables	F 2,500	=20500-18000
Cash generated from operating activities	G 13,750	
Interest paid	-1,050	
Income taxes paid (i)	H -3,450	see working (i)
Net cash from operating activities	I 9,250	
Cash flows from investing activities		
Acquisition of property, plant and equipment (ii)	J -15,500	see working (ii)
Acquisition of intangibles (iii)	K -2,250	see working (iii)
Acquisition of other investments	L -2,500	=0-2500
Net cash used in investing activities	M -20,250	
Cash flow from financing activities		
Proceeds from issue of share capital	N 4,500	=27000-22500
Proceeds from loans and borrowings	O 9,000	=(20500-12500)+(9500-8500)
Dividends paid (iv)	P -5,000	see working (iv)
Net cash from financing activities	Q 8,500	
Net decrease in cash and cash equivalents	-2,500	
Cash and cash equivalents at 1 March 2018	10,000	
Cash and cash equivalents at 28 February 2019	7,500	

Total points

Workings (i) – (iv)

(i) Income tax

Tax liability on 28.02.2018	2,500
Income tax expense	4,450
Income tax paid (= balance)	-3,450
Tax liability on 28.02.2019	3,500

(ii) Property, plant and equipment

Amount on 28.02.2018	36,000
Depreciation	-5,500
Revaluation	2,000
Acquired during the year (= balance)	15,500
Amount on 28.02.2019	48,000

(iii) Intangible assets

Amount on 28.02.2018	2,000
Amortization	-1,250
Acquired during the year (= balance)	2,250
Amount on 28.02.2019	3,000

(iv) Dividends paid

Retained earnings on 28.02.2018	19,500
Profit for the year ended 2019	10,500
Dividends paid (= balance)	5,000
Retained earnings on 28.02.2019	25,000

Question 4: Corporate Finance**(32 points)**

a)

a1)

FCF to firm ABC: $EBIT \times (1 - T) = 1,000 \times (1 - 0.3) = \text{USD } 700 \text{ mn}$ FCF to firm XYZ: $EBIT \times (1 - T) = 800 \times (1 - 0.3) = \text{USD } 560 \text{ mn}$

Thus, the values of the two firms are (estimated operating independently):

$$\text{Value of firm ABC} = \frac{FCF \times (1+g)}{k-g} = \frac{700 \times 1.04}{0.09-0.04} = \text{USD } 14,560$$

$$\text{Value of firm XYZ} = \frac{FCF \times (1+g)}{k-g} = \frac{560 \times 1.06}{0.10-0.06} = \text{USD } 14,840$$

a2)

Cost of capital of the combined firm:

$$9.0\% \times \frac{14,560}{14,560+14,840} + 10.0\% \times \frac{14,840}{14,560+14,840} = 9.5\%$$

a3)

Financial parameters	Combined firm with no synergy (USD mn)	Combined firm with synergies (USD mn)
Revenues	7,500	7,500
Cost of goods sold	-5,700	(B) -5,475
EBIT	1,800	(C) 2,025
Expected growth rate of EBIT	5.0%	5.5%
Cost of capital (WACC)	9.5%	9.5%
Firm value	(A) 14,560 + 14,840 = 29,400	(D) 37,386.6
Value of synergies	-.-	(E) 7,986.6

FCF to combined firm: $EBIT \times (1 - T) = 2,025 \times (1 - 0.3) = 1,417.5$

$$\text{Value of combined firm} = \frac{FCF \times (1 + g)}{k - g} = \frac{1,417.5 \times 1.055}{0.095 - 0.055} = \text{USD } 37,386.6$$

b)

b1)

Value_{Santé SE} = EUR 705 mnValue_{Respiro SE} = EUR 420 mnValue_{combined firm} = Value_{Santé SE after the acquisition} = EUR 1,425 mn

Since

$$(Value_{combined\ firm} - Value_{Santé\ SE}) - Price_{Respiro\ SE} = 0,$$
$$Price_{Respiro\ SE} = EUR\ 720\ mn.$$

EUR 720 mn is the maximum price Santé SE should pay for Respiro SE.

[Alternative answer:

Gain from acquisition = 1,425 – 1,125 = 300, going to shareholders of Respiro SE.

Therefore, the maximum price to pay for Respiro SE is EUR 720 million = EUR 420 million + EUR 300 million.]

b2)

(i)

Net present value of (expected/estimated) synergies:

$$EUR\ 1,425\ mn - EUR\ 705\ mn - EUR\ 420\ mn = EUR\ 300\ mn$$

(ii)

Number of Santé shares to be newly issued:

	Santé SE	Respiro SE	Combined
NPV of synergies	150.0	150.0	300.0
Current market capitalization	705.0	420.0	
After transaction fair equity value	855.0	570.0	1,425.0

Given the take-over price of EUR 570 mn for Respiro SE calculated in above table, the number of shares S^* , that Santé has to offer to Respiro's shareholders is

$$\frac{S^*}{S^* + 10,000,000} \times Value_{combined\ firm} = EUR\ 570\ mn$$

We get:

$$\frac{S^*}{S^* + 10,000,000} \times EUR\ 1,425 = EUR\ 570\ mn$$

Solving for S^* leads to a number of 6,666,667 shares to be newly issued.

[Alternative answer:

Value of Respiro SE = 570 mn; value of one Santé SE including synergies = 855mn/10mn = 85.5. Therefore, Respiro SE will have to issue 570mn/85.5 = 6.666mn shares to acquire Respiro SE.]

(iii)

Share exchange ratio:

$$30,000,000/6,666,667 = 1\ Santé\ share\ per\ 4.5\ Respiro\ shares\ (or\ 2\ per\ 9)$$

(iv)

Respiro shareholders' ownership in "new* Santé:

$$\frac{6,666,667}{6,666,667+10,000,000} = 40\%$$

Question 5: Equity Valuation and Analysis**(52 points)**

a) Case “Company CBA”

a1)

As:

$$k_E = r_F + \beta \times (r_M - r_F)$$
$$k_E = 0.02 + 1.2 \times (0.07 - 0.02) = 0.08 = 8.0\%$$

From:

$$20.8 = \frac{0.80 \cdot (1 + g_{IMPL})}{0.08 - g_{IMPL}}$$

it results that: $g_{IMPL} = 0.04 = 4.0\%$

a2)

$$\text{With payout ratio} = \frac{DPS}{EPS} = \frac{0.80}{1.00} = 0.80 = 80\%,$$

the (implied) sustainable growth rate g is: $g = ROE \times (1 - \pi) = 10\% \times (1 - 0.80) = 2.0\%$

a3)

The model based fair value of CBA’s stock is:

$$P = \frac{DPS \times (1 + g)}{r_E - g} = \frac{0.80 \times (1 + 0.025)}{0.08 - 0.025} = EUR 14.91$$

Therefore, it is not worth buying CBA’s stocks at the current market price of EUR 20.80.

b) Case “Company FED”

b1)

Assuming that a company carries a certain amount of debt and the beta of the debt is zero, the following relationship will hold true for the asset beta of a company holding debt (unlevered beta) β_A and the equity beta (levered beta) β_E :

$$\beta_A = \frac{\beta_E}{\left[1 + (1 - t) \frac{D}{E}\right]}$$

where,

D = total interest-bearing liabilities,

E = market capitalization of equity,

t = corporate income tax rate

Therefore, Company FED's asset beta is:

$$\frac{1.25}{\left[1 + (1 - 0.3) \times 0.1\right]} = 1.168$$

At the current point in time, Company FED has no debt, and the equity beta is the same as the asset beta, 1.168.

b2)

Required rate of return under the capital asset pricing model
= Risk-free rate + beta × (expected rate of return on a market portfolio – risk-free rate)
= 4 + 1.168 × (12 – 4) = 13.344%

b3)

This term's forecast earnings per share
= Book value per share at the beginning of the year × return on equity
= 60 × 0.14 = USD 8.4

This term's forecast residual income per share
= This term's earnings per share – book value per share at the beginning of the year
× required rate of return on stock
= 8.4 – 60 × 0.13 = USD 0.6

b4)

ROE and payout ratio are constant from this term onwards, so from next term onwards, the earnings per share, book value per share and residual income per share will grow at the sustainable growth rate of 11.2%.

Sustainable growth rate = ROE × (1 – payout ratio)
= 14 × (1 – 0.2) = 11.2%

Theoretical share price = book value per share at the beginning of this year + present value of this and subsequent terms' residual income per share

$$= 60 + \frac{0.6}{0.13 - 0.112} = \text{USD } 93.33$$

The results of this calculation indicate that Company FED's share price is trading below its theoretical fair value (at an undervalued).

b5)

This term's forecast dividend per-share
= This term's forecast earnings per share × payout ratio
= 8.4 × 0.5 = USD 4.20

Beginning of next term's book value per share

= Book value per share at the beginning of this term + this term's earnings per share - this term's dividend per-share
= 60 + 8.4 - 4.20 = USD 64.20

Next term's forecast dividend per-share

= Book value per share at the beginning of next term × ROE × payout ratio
= 64.20 × 0.120 × 0.5 = USD 3.852

b6)

From the second year onwards, the dividend per-share would grow at the sustainable growth rate of 6.0%.

$$\begin{aligned}\text{Sustainable growth rate} &= \text{ROE} \times (1 - \text{payout ratio}) \\ &= 12.0 \times (1 - 0.5) = 6.0\%\end{aligned}$$

Using the dividend discount model:

Theoretical share price

= Total of the present value of this term's dividend per-share + present value of subsequent terms' dividend per-share

$$= \frac{4.20}{1.13} + \frac{1}{1.13} \times \frac{3.852}{0.13-0.06} = \text{USD } 52.41$$

b7)

Its ROE is assumed to fall to 12% which is below its cost of equity COE (or required rate of return) of 13%. Therefore, FED is not earning its cost of equity, or in other words FED is starting to “destroy value” and consequently its (theoretical) share price falls below its book value.

c)

Company IHG:

$$\text{Dividend per share at date 1: } \text{GBP } 10 \times 0.40 = \text{GBP } 4.00$$

$$\text{Dividend growth rate: } g = \text{ROE} \times (1 - \pi) = 15\% \times 0.6 = 9.0\%$$

From the dividend growth model, the price of a share today is:

$$\frac{\text{Div}_1}{\text{COE} - g} = \frac{\text{GBP } 4.00}{0.12 - 0.09} = \text{GBP } 133.33$$

Value per share if the firm is a cash cow. The firm pays out all of its earnings as dividends. The dividends would be GBP 10 per year in this case. Because there would be no growth, the value per share is evaluated by the perpetuity formula:

$$\frac{\text{Div}}{\text{COE}} = \frac{\text{GBP } 10}{0.12} = \text{GBP } 83.33$$

The value per share of the growth opportunities is GBP 50.00, i.e the difference between GBP 133.33 and GBP 83.33.

Company MLK:

$$\text{Dividend per share at date 1: } \text{EUR } 8 \times 0.70 = \text{EUR } 5.60$$

$$\text{Dividend growth rate: } g = \text{ROE} \times (1 - \pi) = 8\% \times 0.3 = 2.4\%$$

From the dividend growth model, the price of a share today is:

$$\frac{\text{Div}_1}{\text{COE} - g} = \frac{\text{EUR } 5.60}{0.10 - 0.024} = \text{EUR } 73.68$$

Value per share if the firm is a cash cow. The firm pays out all of its earnings as dividends. The dividends would be EUR 8 per year in this case. Because there would be no growth, the value per share is evaluated by the perpetuity formula:

$$\frac{Div}{COE} = \frac{EUR\ 8}{0.10} = EUR\ 80.00$$

The value per share of the growth opportunities is EUR -6.32, i.e the difference between EUR 73.68 and EUR 80.00.