March 2013 CIIA® Final Examination

FRIDAY, MARCH 8, 2013 **MORNING SESSION**

TIME ALLOWED: 3 HOURS **9.00 AM – 12.00 NOON**

EXAMINATION I:

Economics

Corporate Finance

Financial Accounting and Financial Statement Analysis

Equity Valuation and Analysis

QUESTIONS

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Question 1: Economics **(37 points)**

The Japanese economy is said to be in a deflationary state. The consumer price index at the end of 2011 was at virtually the same level as it was 20 years earlier. Compared to 10 years ago, it is down.

The government of Japan implemented expansionary fiscal policies during the 1990s, but they were not enough to boost the Japanese economy. If anything, the spending merely worsened the government's financial position. At the end of 2011, the outstanding balance of long-term government bonds was 755 trillion yen, 1.6-times nominal GDP (FY2010 figures, 479 trillion yen). The occurrence of a major earthquake in Eastern Japan in March 2011 resulted in additional fiscal measures to rebuild infrastructure.

a) Use a Keynesian consumption function and 45-degree linear model to illustrate and explain a deflationary state by answering the two following questions.

a1) First, explain what a Keynesian consumption function-based 45-degree linear model is. Place GDP (aggregate supply) on the horizontal axis, and assume demand is comprised of only consumption and exogenously given investment. (6 points)

a2) Next, illustrate and explain the deflationary state. In your explanation, compare the deflationary state against a state in which there is neither excess demand nor excess supply. [Hint: Answer by considering the consequences of the deflationary state on the two demand components.] (4 points)

b) Explain the impact of the fiscal measures enacted by the government for reconstruction from the earthquake in the following three questions.

b1) Use the 45-degree linear model to illustrate and explain the impact. Compare with the deflationary state. (4 points)

b2) Use the IS-LM model to illustrate and explain the impact. In your explanation, comment on the differences from the 45-degree linear model. (4 points)

b3) Ultimately, the expansionary fiscal policies of Japan in the 1990s did not have an economic effect. Explain in general terms what kind of a socio-economic state would undermine the impact of fiscal policies. Identify two points. (4 points)

c) Consider the fiscal problems of the government of Japan. Assume in your answers that government debt consists entirely of long-term government bonds.

c1) Explain what the government's primary balance is and the impact that fiscal measures for the rebuilding of infrastructure will have on the primary balance. (3 points)

c2) Explain the relationship between the government bond balance at the end of Year 0 and the end of Year 1 if the primary balance is balanced (i.e. zero balanced). [Hint: If you could not answer question c1), suppose the government fiscal balance is null only with the short term government debt.] (3 points)

c3) Describe the future relationship between the balance of long-term government debt and nominal GDP for a country like Japan in which (i) the balance of long-term government debt is higher than nominal GDP and (ii) the interest rate on long-term government bonds is higher than the nominal GDP growth rate. Assume the primary balance is zero-balanced. [Hint: If you could not answer question c1), suppose the government fiscal balance is null only with the short term government debt.] (3 points)

c4) Japan's fiscal problems are often compared with Greece's. In both countries, the balance of long-term government debt is higher than the nominal GDP. They both have primary balances in the red as well. [Hint: If you could not answer question c1), suppose the government fiscal balance is negative only with the short term government debt.]
In the case of Greece, government bonds were heavily sold in 2010, resulting in a substantial increase in the interest rates on long-term government bonds. By contrast, the interest rate on Japanese long-term government bonds remains stable at around 1%. There are two direct factors that are often pointed to for the differences between the two countries: 1) Greece's balance of payments is in the red at the current account level and the majority of its government debt is in the hands of foreign investors; and 2) Japan by contrast is in the black at the current account level and more than 90% of its government debt is held by domestic investors.
Discuss the differences in Japan's and Greece's investors and the differences in the interest rates on their long-term government bonds from the perspective of the IS (investment and savings) balance and balance of payments. (6 points)

Question 2: Financial Accounting and Financial Statement Analysis (44 points)

Table 1 contains data from Company X's financial statements for 2012 (actual results) and the forecasts by Mr. A, an analyst, for the period from 2013 to 2017. Mr. A's report presents a scenario analysis with two cases, Case 1 and Case 2.

a) Mr. A uses the following assumptions to make the Case 1 forecasts:

- Net sales will grow at a rate of 4% per year.
- The gross profit margin and the ratio of selling, general and administrative expenses to net sales will not change from FY2012.
- The rate of return for cash & cash equivalents (annualized: 2%) and the interest rate for financial liabilities (annualized: 4%) will remain the same for each year.
- Income from cash & cash equivalents and interest-bearing liability expenses are calculated on the basis of end-of-year balances.
- The balance of interest-bearing liabilities is constant each year and does not change.
- Shareholders' equity is calculated as "Shareholders' equity at the end of the previous year + Net income − Dividends."
- Net cash flow is calculated as "Net income + Depreciation − Increase in net working capital* − Capital investment + Increase in interest-bearing liabilities − Dividends."
- *Increase in net working capital is calculated as "Increase in current assets − Increase in current liabilities (excluding interest-bearing liabilities)."
- The change in net cash flow is adjusted with cash & cash equivalents on the non-

consolidated balance sheet.

- The corporate income tax rate is equal in each year (40%). Interest on financial liabilities is tax deductible.
- The dividend payout ratio remains stable at 40% of Net income.
- The balance of tangible fixed assets for the fiscal year is calculated as "Balance of tangible fixed assets for the previous fiscal year + This year's capital investment – This year's depreciation."
- Dividends are paid each fiscal year.
- The turnover of current assets (excluding cash & cash equivalents) and the turnover of liabilities (excluding interest-bearing liabilities) are constant each year (calculated at the end of the fiscal year).
- In your calculations, round all your intermediate and final results to the first decimal place. Show your calculations where this might be helpful for the sake of clarity.

Calculate and fill in the eight boxes (a) until (h) in the following table. (24 points)

Case 1	**Actuals**	**Actuals**	**Forecast**	**Forecast**	**Forecast**	**Forecast**	**Forecast**
Term-end balance sheet	**End of FY2011**	**End of FY2012**	**End of FY2013**	**End of FY2014**	**End of FY2015**	**End of FY2016**	**End of FY2017**
Cash & cash equivalents	1,050.0	1,217.4	(a)		1,803.8		(g)
Current assets	2,150.0	2,215.0			2,488.6	2,588.1	2,691.7
Tangible fixed assets	1,350.0	1,350.0		1,362.0	1,379.0		(h)
Total assets	4,550.0	4,782.4					
Current liabilities (excluding interest-bearing liabilities)	1,960.0	2,000.0			2,249.2	2,339.1	2,432.7
Interest-bearing liabilities	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
Shareholders' equity	1,590.0	1,782.4	(b)	2,199.0	2,422.2	2,655.9	
Total liabilities and shareholders' equity	4,550.0	4,782.4					
		FY2012	**FY2013e**	**FY2014e**	**FY2015e**	**FY2016e**	**FY2017e**
Non-consolidated statement of income							
Net sales		6,450.0	6,708.0	6,976.3	7,255.4	7,545.6	
Cost of sales		1,750.0	1,817.9				
Gross income on sales		4,700.0	4,890.1				(c)
Sales, general and administrative expenses		4,150.0	4,313.2				

Operating income		550.0	576.9		624.0		674.9
Income from cash & cash equivalents		24.3	28.2		36.1		44.5
Interest-bearing liability expenses		40.0	40.0		40.0		
Pretax profit		534.3	565.1			649.1	
Tax expenses		213.7	226.0				
Net income		320.6	339.1				(d)
Statement of cash flow							
Net income		320.6	339.1				(d)
Depreciation		150.0	161.0	162.0	158.0	155.0	158.0
Change in net working capital		25.0	6.4				(e)
Capital investment		150.0	165.0	170.0	175.0	175.0	175.0
Change in interest-bearing liabilities		0.0	0.0	0.0	0.0	0.0	0.0
Dividend		128.2	135.6				
Net cash flow		167.4	193.1	196.3	197.0	204.1	(f)

b) Fill in the blanks in the following tables for FY2012 and FY2017. In your analysis, calculate each of the balance sheet account figures as at the end of each fiscal year. In your calculations, round to the second decimal place.

FY2012	
ROE =	…….
Net income to net sales =	…….
Asset turnover =	…….
Total assets to equity =	…….

FY2017	
ROE =	…….
Net income to net sales =	…….
Asset turnover =	…….
Total assets to equity =	…….

(8 points)

c) Mr. A, the analyst rates the investment code for the company as “unattractive” for Case 1. Thus, he considers an alternative case (Case 2). Case 2 is based on the implementation of a more aggressive corporate strategy by Company X (see table below for the details of case 2). Under the new assumptions, Analyst A changes his investment rating to "strong buy".

Case 2

Term-end balance sheet	End of FY2011	End of FY2012	End of FY2013	End of FY2014	End of FY2015	End of FY2016	End of FY2017
Cash & cash equivalents	1,050	1,217	1,440	1,673	1,905	2,138	2,360
Current assets	2,150	2,215	2,358	2,499	2,649	2,808	2,976
Tangible fixed assets	1,350	1,350	2,230	2,100	1,979	1,864	1,769
Total assets	4,550	4,782	6,027	6,272	6,533	6,810	7,106
Current liabilities (excluding interest-bearing liabilities)	1,960	2,000	2,137	2,265	2,401	2,545	2,697
Interest-bearing liabilities	1,000	1,000	2,000	2,000	2,000	2,000	2,000
Shareholders' equity	1,590	1,782	1,891	2,007	2,132	2,266	2,408
Total liabilities and shareholders' equity	4,550	4,782	6,027	6,272	6,533	6,810	7,106

Non-consolidated statements of income	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017
Net sales	6,450	6,837	7,247	7,682	8,143	8,632
Cost of sales	1,750	1,855	1,966	2,084	2,209	2,342
Gross income on sales	4,700	4,982	5,281	5,598	5,934	6,290
Sales, general and administrative expenses	4,150	4,328	4,587	4,863	5,155	5,464
Operating income	550	654	693	735	779	826
Income from cash & cash equivalents	24	29	33	38	43	47
Interest-bearing liability expenses	40	80	80	80	80	80
Pretax profit	534	603	647	693	742	793
Tax expenses	214	241	259	277	297	317
Net income	321	362	388	416	445	476

Statement of cash flow						
Net income	321	362	388	416	445	476
Depreciation	150	285	280	271	265	245
Change in net working capital	25	6	13	14	15	16
Capital investment	150	1,165	150	150	150	150
Increase in interest-bearing liabilities	0	1,000	0	0	0	0
Dividend	128	253	272	291	312	333
Net cash flow	167	223	233	232	234	222

c1) In Case 2, how will the ROE for FY2017 change? (2 points)

c2) In Case 2, how will the 5-year cumulative (FY2013-FY2017) investment amount change? Compare this result against that obtained for Case 1. (3 points)

c3) Of the three ROE (DuPont model) factors, how will the FY2017 net profit margin change in Case 2? What will be the major factor in that change? (3 points)

c4) In Case 2, FY2017 ROE is higher than in Case 1. One of the reasons for this is different financial policies. Identify two points in this regard. (4 points)

Question 3: Financial Accounting and Financial Statement Analysis (16 points)

Answer Questions a) through c) regarding Company Y's FY2011 transactions, events and estimate changes. In your answers, identify the amount of the impact and the reasons for it. You do not need to consider taxation.

a) At the beginning of FY2011, Company Y issued convertible bonds with face value of 5 billion CU. The issue was made at 100% of face value. The bonds mature in 3 years and carry coupons of 5% per annum, payable at the end of the fiscal year. Yields to maturity for similar straight bonds without share-purchase warrants are 7% per annum. During FY2011 there was no exercise of share-purchase warrants. You do not need to take account of the investment of the funds raised, or any other transactions or events. Insert the relevant numbers required in the boxes below, with supporting discussions and reasoning.

Impact on equity at the end of FY2011	…….
Impact on FY2011 net profit	…….
Impact on net profits for FY2012 and the following years (cumulative) during the life of the bond. Assume: There is no exercise of share-purchase warrants.	…….

(6 points)

b) The environment has significantly deteriorated for Company Y's Business A, and the forecast is for a sharp decline in future cash flows from this business. Business A was acquired from Company X at the beginning of FY2010 for a price of 12 billion CU. At the end of FY2011, Business A had identifiable assets (all tangible fixed assets) with book values totalling 6.3 billion CU and a book value of goodwill totalling 3.6 billion CU. In addition, at the end of FY2011, Business A's (cash-generating unit) recoverable amount was 4.9 billion CU. Complete the following table with supporting numbers and reasoning for your answers.

Impact on goodwill at the end of FY2011	…….
Impact on FY2011 net profit	…….

(4 points)

c) Company Y decided during FY2011 to review the useful life for its production facility, changing it from 10 to 7 years. The facility was acquired at the beginning of FY2008 for 3 billion CU, and it is being depreciated using the straight-line method with a residual value of

zero. Complete the following boxes and in your answer, discuss the impacts that arise from the changes in depreciation expenses due to the change of the useful life of the production facility.

Impact on tangible fixed assets at the end of FY2011	……..……..
Impact on FY2011 net profit	…….....
Impact on net profits for FY2012 and the following years (cumulative) over which the production facility would be depreciated	…….

(6 points)

<u>Question 4:</u> Corporate Finance / Equity valuation and analysis (48 points)

Frontpage is a fast growing internet start-up company operating a global social network and making profit primarily from advertising on this internet platform. Despite its large market share, the firm is still privately held by the founder and a small but increasing group of institutional investors. In order to take advantage of potential growth opportunities, the current owners are considering some form of public issue on the stock market in the medium term when disclosure becomes mandatory due to an enlarged investor base.

However, valuations in stock markets are currently depressed so that the window for initial public offerings is effectively closed. Therefore, the owners are evaluating the possibility of making a 'backdoor' equity issuance by selling convertible bonds to a group of large institutional investors and using the proceeds to partially cash in on their equity stake. Furthermore, the CEO of Frontpage is considering the idea of expanding into internet communications services such as email, chat and voice over IP which should help in stabilizing cash flows from advertising.

The investment bank hired to facilitate these transactions has generated the following forecast of Frontpage's Income Statement, Balance Sheet and Projected Investments.

Table 1: Projected Income Statement (in EUR 1,000)

Year	**1**	**2**	**3**	**4**
Sales	800,000	1,200,000	1,550,000	1,850,000
Operating Cost	550,000	800,000	1,030,000	1,240,000
Depreciation	40,000	40,000	40,000	40,000
EBIT	210,000	360,000	480,000	570,000
Interest Expense	80,000	80,000	80,000	80,000
Profit before Taxes	130,000	280,000	400,000	490,000
Taxes	52,000	112,000	160,000	196,000
Profit after Tax	78,000	168,000	240,000	294,000

Table 2: Projected Balance Sheet (Book Values) (in EUR 1,000)

Year	0	1	2	3	4
Inventories	40,000	42,000	44,000	46,000	48,000
Receivables	102,000	120,000	138,000	156,000	174,000
Payables	95,000	110,000	125,000	145,000	165,000

Table 3: Projected Investments (in EUR 1,000)

Year	1	2	3	4
Net Investments*	31,000	61,000	78,000	92,000

* Note: Net Investments = Capital expenditure – disposal of fixed assets

Moreover, the investment bankers assume that cash flows will grow at 6% p.a. after the fourth year. In addition, analysts estimate that the credit spread over the risk free rate applicable to the firm's debt is 250 basis points. Currently, Frontpage's capital structure consists of 50% debt. The applicable tax rate is 40%. The risk-free rate equals 3%, the expected equity market return is 12% and the firm's beta is 1.3. Due to limited secondary market trading (over-the-counter) in Frontpage's shares, the investment bankers estimate that the cost of equity capital should also include a liquidity risk premium of 2.5%.

a) In order to assess the potential size of the convertible bond offering the investment bankers need to make a valuation of Frontpage.

   a1) Calculate the free cash flow to the firm. (10 points)

   a2) Calculate the cost of capital and determine the firm value of Frontpage as a private company. (9 points)

b) The investment bankers estimate that Frontpage would be able to sell convertible bonds with total face value of 500,000,000 EUR to institutional investors. They assume that these bonds could be sold at 96% of par value if the owners agree to the following conditions:
   - Annual coupon of 3%
   - Maturity 6 years
   - Each bond with a par value of 1,000 EUR is convertible into 10 shares in Frontpage at the final maturity of the bond.

   The proceeds from the bond issue will be used to make a special dividend payment to the current owners in order to let them cash out on a part of their equity stake.

   b1) Determine the net present value of the financing advantage compared to a straight debt issue. What does this financing advantage reflect in economic terms and why can the convertible bond not be considered as 'cheap debt' despite its low coupon? (6 points)

b2) Determine whether the convertible bond transaction helps to increase firm value based on the assumption that the convertible bond offering leads to an increase in Frontpage's debt-to-asset ratio from 50% to 60% and that it leads to a decline in the liquidity risk premium to 1.5%. Furthermore, assume that the convertible debt financing does not lead to a change in the cost of debt financing. (11 points)

c) As mentioned earlier, Frontpage's CEO is evaluating the idea of expanding into internet communications services such as email, chat and voice over IP. He projects incremental cash flows to the firm of 105,000,000 EUR in the first year, 110,000,000 EUR in the second year and 120,000,000 EUR in the third. Thereafter, he expects cash flows to grow by 5% p.a. However, due to the risks inherent in expanding the current business model to this new market segment, the beta equals 1.6 for this new project. Furthermore, an initial outlay of 1,800,000,000 EUR is required to implement this project.

Based on the company's current capital structure (Assumption: The project's financing does not change the company's current capital structure.) and weighted average cost of capital (before the convertible bond issue), he estimates that this project will increase firm value by approximately 266,000,000 EUR. Assume a liquidity risk premium of 2.5% in your calculations.

c1) Do you agree with the CEO's approach in the capital budgeting process? Explain and show graphically by plotting expected return against project risk why he should pay particular attention to project-specific risk in the calculation of the project's net present value. (5 points)

c2) Calculate the correct net present value based on the assumption that the project's beta equals 1.6. Should the project be carried through under these assumptions? Explain your answer. (7 points)

<u>Question 5:</u> Equity valuation and analysis (35 points)

Although many analysts consider the discounted cash flow methods to be theoretically sound, they find its use in security valuation to be problematic. Monica Lien belongs to the group of analysts who would rather use the price-to-earnings multiple (PE ratio, P/E ratio) to value and compare stocks. She finds that the P/E ratio method renders the equity valuation relatively easy and straight forward.

a) List and discuss three factors that make the P/E ratio an attractive, and therefore, widely used choice in pricing stocks and comparing the attractiveness of different stocks. (6 points)

b) Despite its ease, using P/E ratios for valuation is not free of problems. Discuss briefly three potential problems associated with using P/E ratios for comparing stocks in the same country. (6 points)

Monica has collected the following information about QuickCart Stores, a discount retailer which is rapidly expanding in all major U.S. cities and HiClass Apparels, a high-end retailer of fashion clothing for men and women with presence in prime retail locations in the upper U.S. Midwest.

	QuickCart Stores	HiClass Apparels
Historical and expected return on equity (ROE)	14%	16%
Historical and expected dividend payout ratio	32%	65%
Beta	1.30	1.15

Expected return on S&P500 index	10.5%
Expected risk-free return	4.5%

c) Calculate the required rate of return for QuickCart and HiClass. (4 points)

In questions d), e) and f), the subscript "0" in the P/E ratios refers to current values of the variables and "1" to one period ahead values.

d) Calculate the P/E (P_0/E_0) ratios using the earnings in the most recent time period for both the companies. (7 points)

Hint: you know that

$$P_0 = \frac{DPS_1}{(r-g)}$$

$$DPS_1 = EPS_1 \cdot \text{Payout ratio}$$

$$DPS_1 = EPS_0 \cdot (1+g) \cdot \text{Payout ratio}$$

e) On the Internet, Monica notices that HiClass is trading at 20 times its forecasted earnings. Calculate the long-term growth rate implied in HiClass's current P_0/E_1 ratio. (6 points)

f) Your calculations show that the P_0/E_1 ratio for QuickCart is different from that for HiClass. Briefly discuss three possible reasons why the P/E ratios of the two companies might be different (calculation of P/E ratios not required). (6 points)

EXAMINATION I

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Solutions

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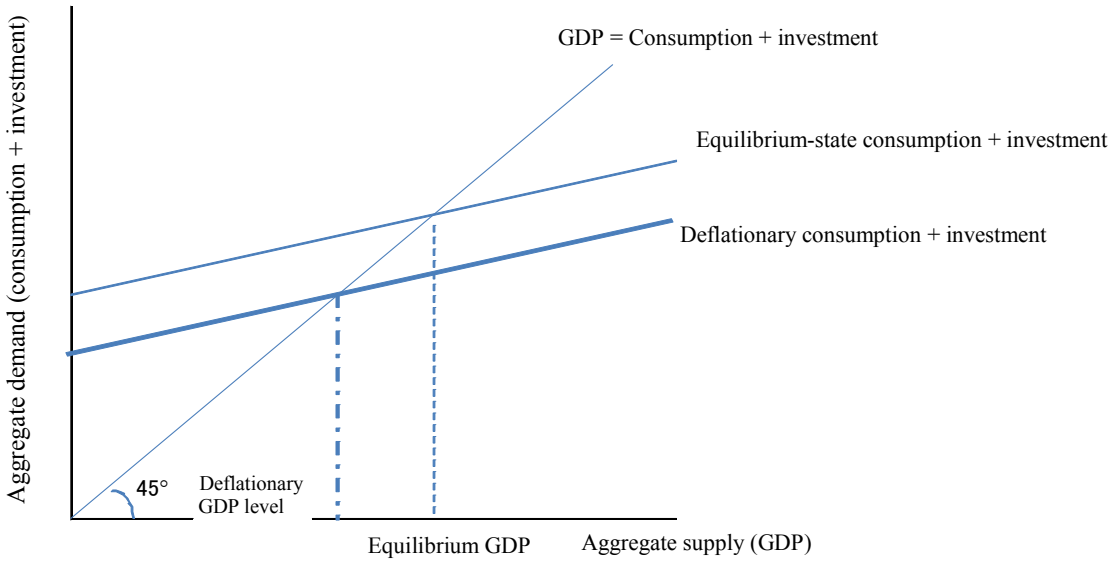
S Q1 March12 : Economics

a)
a1)
The 45-degree linear model explains the equilibrium point between demand and supply in the goods market. It is based on the principle of effective demand and assumes that aggregate demand determines aggregate supply. (2 points)

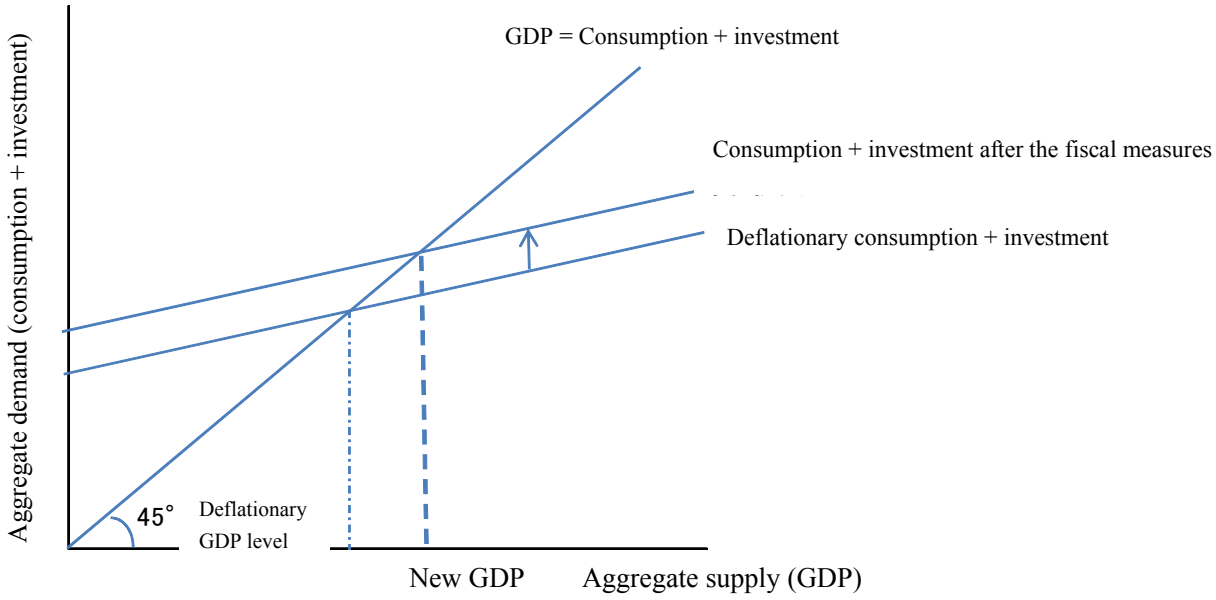
Conversely, the Keynesian consumption function is expressed by the following function.
Consumption $C = C_0 + cY$
(C_0 is the portion of consumption not proportional to income; c is the marginal propensity to consume, Y is national income = GDP) (2 points)

This consumption function assumes there is consumption that is not proportional to income and that the marginal propensity to consume is between 0 and 1. This means that the intercept of the straight line expressing aggregate demand (consumption + independent investment) is positive and its slope is less than 1, which allows an intersection to be found with a straight line extending at a 45° angle from the origin (aggregate demand and aggregate supply match). The perpendicular leg drawn down from the intersection of the two straight lines to the horizontal axis represents the level of GDP (aggregate supply) that matches aggregate demand. (2 points)

a2)
A state in which there is neither excess demand nor excess supply is called an "equilibrium point GDP." Deflation is a state in which demand is low in comparison with the equilibrium point GDP. If there is no change in the coefficient of the Keynesian consumption function, independent investment as demand will be smaller than the equilibrium level, which will result in a deflationary state. This can be represented as a parallel movement downwards of the straight line expressing "consumption + investment" that creates equilibrium, so that aggregate demand is at the new level where the 45° line is intercepted. (Answers can also be marked correct if the explanation is that independent investment does not change but the propensity to consume declines and the diagram illustrates that.)
(2 + 2 points for the diagram)

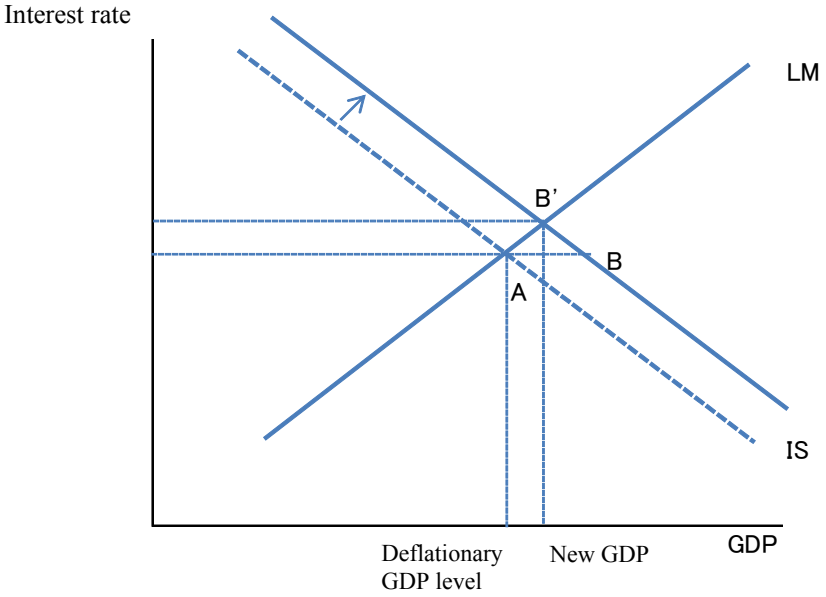


b)
b1)
The fiscal measures for reconstruction will increase independent investment, so that the point at which demand and supply match shifts upwards to the right, meaning that GDP increases. The increase in GDP has a multiplier effect. This is the direct impact of a stimulus package. Indirectly, it may also stimulate private-sector capital investment and increase marginal propensity to consume. (2 + 2 points for the diagram)



b2)
Fiscal measures for reconstruction will shift the IS curve upwards to the right so that ultimately the intersection of the IS- LM curves moves from A to B'. The multiplier effect of the fiscal measure will cause GDP to increase to Point B, but at Point B, the money market will enter a state of excess demand, which will increase interest rates. This is the crowding out effect and it results in GDP dropping to Point B', which represents the new GDP.

(2 + 2 points for the diagram)



b3)
The following reasons are conceivable.

- The economy falls into a deflationary state and asset prices decline, bringing instability to the financial system and upheavals to the economy.
- The supply of funds does not increase because of the instability in the financial system, but the crowding out impact does increase.
- Population peaks and turns downwards to produce a long-term lack of demand so that transient fiscal policies do not have enough impact to alleviate deflation.
- Domestic supplies do not reach the levels indicated by fiscal policy, and instead the difference is made up for with higher imports, therefore, there is no change in domestic deflation.
- Fiscal policies increase the government deficit, which reduces confidence in the country's economy, resulting in higher interest rates and a greater degree of crowding out.
- …

(2 points per reason, max 4 points)

c)
c1)
The primary balance is the difference between government "revenues" and "expenditures excluding interest on long-term government bonds." Fiscal measures for reconstruction are a factor for deficits on the primary balance. (1 point)
If government investments are used to strengthen production facilities, they are a factor increasing the GDP and may also result in an increase in tax revenue, but there is little likelihood of an increase in tax revenue simply from reconstruction. (2 points)

[Note to the correctors for answers c2), c3) and c4):
If the candidate uses the "Hint", you have to consider the entire long term debt and not only the interest rate.]

c2)
The only government revenue and expenditure not included in the primary balance is the payment of interest on long-term government bonds. Therefore, if the primary balance is balanced, then the overall government fiscal balance is negative by the amount of the long-term government bond interest payments. The funding for interest payments basically must be generated from long-term government bonds, so the balance of long-term government debt will increase by the amount of interest paid on long-term government bonds. In other words, the balance of long-term government debt at the end of Year 1 will be the balance of long-term government debt at the end of the Year 0 plus 1 year of interest payments on the balance. (3 points)

c3)
The primary balance is zero balanced, which means that the balance of long-term government debt grows by the interest rate on long-term government debt. Nominal GDP grows by the nominal GDP growth rate, but this problem assumes that the nominal GDP growth rate is lower than the interest rate on long-term government debt. Initially, "Balance of long-term government debt/Nominal GDP" is greater than 1 and the growth rate for the numerator, balance of long-term government debt, is larger, so "Balance of long-term government debt/Nominal GDP" will continue to be above 1. (3 points)

c4)
The major economic factor resulting in different investors in domestic financial markets is whether the balance of payments is in the red or the black at the current account level. If the current account is in the red, it creates a situation in which domestic savings are not able to cover domestic investments and the country is therefore dependent upon investments from outside. On the other hand, if the current account is in the black, the country has no need to depend on outside investments (unless domestic investors prefer foreign investments). The Greek balance of payments is in the red at the current account level and the Japanese in the black, and this fact creates significant differences in the investors in the two countries' long-term government bonds. (3 points)

In the case of Greece, foreign investors hold more than half of long-term government bonds, so the country is necessarily dependent on foreign investment. If foreign investors lose confidence in Greek finances, they will flee the Greek market, resulting in a commensurate decline in the price of government bonds (rise in the interest rates). By contrast, even if foreign investors are uncertain about Japanese finances and flee the Japanese market, at the current point in time there will be no major change in the price of government bonds as long as domestic investors continue to invest in them. In both cases, domestic investors have a

home-country bias. This difference is a basic factor behind the difference in interest rates on long-term government bonds. (3 points)

(Another answer could be differences in the stage of industrial development in Japan and Greece, which leads to different investor evaluations of two countries' abilities to make economic and fiscal responses. Partial credit as a correct answer is awarded for this argument.)

S Q2 March12 : Financial Accounting and Financial Statement Analysis

a)

Case 1	Actuals	Actuals	Forecast	Forecast	Forecast	Forecast	Forecast
Term-end balance sheet	End of FY2011	End of FY2012	End of FY2013	End of FY2014	End of FY2015	End of FY2016	End of FY2017
Cash & cash equivalents	1,050.0	1,217.4	**1,410.5**	1,606.7	1,803.8	2,007.9	**2,225.5**
Current assets	2,150.0	2,215.0	2,300.8	2,392.9	2,488.6	2,588.1	2,691.7
Tangible fixed assets	1,350.0	1,350.0	1,354.0	1,362.0	1,379.0	1,399.0	**1,416.0**
Total assets	4,550.0	4,782.4	5,065.3	5,361.6	5,671.4	5,995.0	6,333.1
Current liabilities (excluding interest-bearing liabilities)	1,960.0	2,000.0	2,079.5	2,162.7	2,249.2	2,339.1	2,432.7
Interest-bearing liabilities	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0	1,000.0
Shareholders' equity	1,590.0	1,782.4	**1,985.8**	2,199.0	2,422.2	2,655.9	2,900.5
Total liabilities and shareholders' equity	4,550.0	4,782.4	5,065.3	5,361.6	5,671.4	5,995.0	6,333.1
		FY2012	FY2013e	FY2014e	FY2015e	FY2016e	FY2017e
Non-consolidated statement of income							
Net sales		6,450.0	6,708.0	6,976.3	7,255.4	7,545.6	7,847.4
Cost of sales		1,750.0	1,817.9	1,890.6	1,966.2	2,044.9	2,126.6
Gross income on sales		4,700.0	4,890.1	5,085.7	5,289.2	5,500.7	**5,720.8**
Sales, general and administrative expenses		4,150.0	4,313.2	4,485.8	4,665.2	4,851.8	5,045.9
Operating income		550.0	576.9	599.9	624.0	648.9	674.9
Income from cash & cash equivalents		24.3	28.2	32.1	36.1	40.2	44.5
Interest-bearing liability expenses		40.0	40.0	40.0	40.0	40.0	40.0
Pretax profit		534.3	565.1	592.0	620.1	649.1	679.4
Tax expenses		213.7	226.0	236.8	248.0	259.6	271.8
Net income		320.6	339.1	355.2	372.1	389.5	**407.6**
Statement of cash flow							
Net income		320.6	339.1	355.2	372.1	389.5	**407.6**
Depreciation		150.0	161.0	162.0	158.0	155.0	158.0
Change in net working capital		25.0	6.4	8.9	9.2	9.6	**10.0**
Capital investment		150.0	165.0	170.0	175.0	175.0	175.0
Change in interest-bearing liabilities		0.0	0.0	0.0	0.0	0.0	0.0
Dividend		128.2	135.6	142.1	148.8	155.8	163.1
Net cash flow		167.4	193.1	196.3	197.0	204.1	**217.6**

Sample answers provided in boxes:

- 1,411 : 1,410.5 = 1,217.4 + 193.1 (3 points)
- 1,986 : 1,985.8 = 1,782.4 + 339.1 – 135.6 (3 points)
- 5,721 : 5,720.8 = (7,545.6 · 1.04) · 0.729 (3 points)
- 408 : 407.6 = (674.9 + 44.5 – 40.0) · 0.6 (3 points)
- 10 : 10.0 = (2,691.7 – 2,588.1) – (2,432.7 – 2,339.1) (3 points)
- 218 : 217.6 = 407.6 + 158.0 – 10.0 - 175.0 – (407.6 · 0.4) (3 points)
- 2,226 : 2,225.5 = (1,803.8 + 204.1) + 217.6 (3 points)
- 1,416 : 1,416.0 = 1,379.0 + (175.0 – 155.0) + (175.0 - 158.0) (3 points)

b)
FY2012:

- ROE = 320.6 / 1782.4 = 17.98% → 18.0%
- Net income to net sales = 320.6 / 6,450.0 = 4.97% → 5.0%
- Asset turnover = 6,450.0 / 4,782.4 = 1.35 →1.4
- Total assets to equity = 4,782.4 / 1,782.4 = 2.68 → 2.7

FY2017:

- ROE = 407.6 / (2655.9 + 407.6 - 163.1) = 14.05% → 14.1%
- Net income to net sales = 407.6 / 7,847.4 = 5.19% → 5.2%
- Asset turnover = 7,847.4 / (2,432.7 + 1,000.0 + 2,900.5) = 1.24 → 1.2
- Total assets to equity = 6,333.1 / 2,900.5 = 2.18 → 2.2

(2 points for ROE, 2 points for net income to net sales, 2 points for asset turnover, 2 points for total assets to equity, max 8 points)

c)
c1)
ROE FY2017 = 476 / 2408 = 0.1982 = 19.8% (2 points)

c2)
Case 1 cumulative investment: 165 + 170 + 175 + 175 + 175 = 860 million CU.

Case 2 cumulative investment: 1,165 + 150 + 150 + 150 + 150 = 1,765 million CU.
(3 points)

c3)

$$\frac{\text{Net income}}{\text{Equity}} = \frac{\text{Net income}}{\text{Sales}} \cdot \frac{\text{Sales}}{\text{Total assets}} \cdot \frac{\text{Total assets}}{\text{Equity}}$$

Case 1: $\frac{407.6}{7{,}847.4} \cdot \frac{7{,}847.4}{6{,}333.1} \cdot \frac{6.333{,}1}{2{,}900.5} = 0.052 \cdot 1.239 \cdot 2.183 = 0.1405$, i.e.14.05%

Case 2: $\frac{476}{8{,}632} \cdot \frac{8{,}632}{7{,}106} \cdot \frac{7{,}106}{2{,}408} = 0.055 \cdot 1.215 \cdot 2.951 = 0.198$, i.e.19.8%

Net income to net sales for FY2017 = $\frac{476}{8{,}632} = 5.51 = 5.5\%$ (1 point)

The sales growth rate increased because of the investment seen in Case 2 (the Case 2 growth rate is 6% compared to a Case 1 growth rate of 4%). This increases depreciation charges, but is expected to have a beneficial impact on sales efficiency, production efficiency and sales unit prices. (2 points)

c4)

Two points can be made:

- The FY2013 investment of 1,000 was raised through interest-bearing liabilities. This is an attempt to increase financial leverage and profits.
- The dividend payout ratio increased from 40% to 70%. If kept at 40%, investment would increase net cash flow, but that would result in an increase in cash & cash equivalents (worse in asset efficiency), which the company wanted to avoid.

(2 points per key points, max 4 points)

S Q3 March12 : Financial Accounting and Financial Statement Analysis

a)

Impact on equity at the end of FY2011

Accounting for share-purchase warrants will result in an increase of 262 million CU.

Explanation (Unit: 1 million CU):

The value of the debt component of the convertible bond is calculated as shown below.

$$\frac{250}{1+0.07}+\frac{250}{(1+0.07)^2}+\frac{250+5{,}000}{(1+0.07)^3}=4{,}738$$

Therefore, the value of the equity component is as shown below.

5,000 - 4,738 = 262

(2 points)

Impact on FY2011 net profit

Borrowing costs will result in a 332 million CU decline.

Explanation (Unit: 1 million CU):

Borrowing costs for FY2011 are calculated as shown below.

$4{,}738 \cdot 0.07 = 332$

(2 points)

Impact on net profits for FY2012 and the following years (cumulative)

If share-purchase warrants are not exercised, borrowing costs will result in a decline of 680 million CU.

Explanation (Unit: 1 million CU):

Borrowing costs for individual years are calculated as shown below.

	Book value at beginning of year	Borrowing costs	Interest payments	Difference	Book value at end of year
FY2011	4,738	332	250	82	4,820
FY2012	4,820	337	250	87	4,907
FY2013	4,907	343	250	93	5,000

Cumulative borrowing costs for FY2012 and FY2013: 337 + 343 = 680 million CU.

(2 points)

b)
Impact on goodwill at the end of FY2011
The impairment loss will result in a decline of 3.6 billion CU.

Explanation (Unit: 1 million CU):
The impairment loss for Business A (cash-generating unit) is calculated as shown below.
(6,300 + 3,600) - 4,900 = 5,000
This impairment loss is first allocated to goodwill (3.6 billion) and then to identifiable assets (1.4 billion).

(2 points)

Impact on FY2011 net profit
The impairment loss will result in a decline of 5 billion CU.

(2 points)

c)
Impact on tangible fixed assets at the end of FY2011
The increase in depreciation expense will result in a decline of 225 million CU.

Explanation (Unit: 1 million CU):
Book value at the beginning of FY2011 is as shown below.

$$3{,}000 \cdot \frac{7}{10} = 2{,}100$$

FY2011 depreciation expense with a useful life of 10 years (remaining useful life of 7 years at the beginning of FY2011) and FY2011 depreciation expense with a useful life of 7 years (remaining useful life of 4 years at the beginning of FY2011) are calculated as shown below.
Useful life of 10 years: 3,000 / 10 = 300
Useful life of 7 years: $2{,}100 \cdot \frac{1}{4} = 525$
Therefore, the change in useful life will increase FY2011 depreciation expense by 225 million CU and will decrease the book value of tangible fixed assets at the end of FY2011 by 225 million CU.

(2 points)

Impact on FY2011 net profit
The increase in depreciation expense will result in a decline of 225 million CU.

(2 points)

Impact on net profits for FY2012 and the following years (cumulative)
The decrease in depreciation expense will result in an increase of 225 million CU.

Explanation:
Cumulative depreciation for FY2012 and subsequent years;
- without change: 300 x 6 years = 1,800
- after the change: 525 x 3 years = 1,575
Decrease in cumulative depreciation expense: 1,575 – 1,800 = 225 million CU.
$\Rightarrow$ Increase in cumulative profits: 225 million CU.

(2 points)

S Q4 March12 : Corporate finance / Equity valuation and analysis

a)
a1)
Calculation of cash flows to the firm (in EUR 1,000):

	1	2	3	4
EBIT	210,000	360,000	480,000	570,000
Taxes (EBIT · Tax Rate)	-84,000	-144,000	-192,000	-228,000
Depreciation	+40,000	+40,000	+40,000	+40,000
Increase in Curr. Ass.	-20,000	-20,000	-20,000	-20,000
Increase in Curr. Liab	+15,000	+15,000	+20,000	+20,000
Net Investments	-31,000	-61,000	-78,000	-92,000
Free Cash Flows	**130,000**	**190,000**	**250,000**	**290,000**

(2 points for the correct formula, 8 points for the numbers, max 10 points)

a2)
Calculate the cost of equity capital using the CAPM:

$$r_{Equity} = 3\% + 1.3 \cdot (12\% - 3\%) = 14.70\%$$ (2 points)

Adjust the cost of equity capital for the liquidity risk premium:

$$r_{Equity} = 14.70\% + 2.50\% = 17.20\%$$ (1 point)

Calculate the weighted average cost of capital using the 5.5% (risk free rate + credit spread) to approximate the cost of debt financing:

$$r_{WACC} = 0.5 \cdot 17.20\% + 0.5 \cdot (3\% + 2.50\%) \cdot (1 - 0.4) = 10.25\%$$ (2 points)

Calculate the value of the firm given the cash flow forecast and the long-term growth rate of 6% (Result in EUR 1,000):

$$\text{Value}_{Firm} = \frac{130,000}{1+0.1025} + \frac{190,000}{(1+0.1025)^2} + \frac{250,000}{(1+0.1025)^3} + \frac{290,000}{(1+0.105)^4} + \frac{1}{(1+0.1025)^4} \cdot \frac{290,000 \cdot 1,06}{0.1025 - 0.06}$$
$$= 5,552,603.86$$

(2 points for the discounted cash flows, 2 points for the terminal value, max 4 points)

b)
b1)
The value of the convertible debt offering can be calculated by discounting the interest payments of 3% p.a. at the required rate of return of 5.5% (credit spread + risk free rate):

$$\text{BondValue} = \frac{30}{1.055} + \frac{30}{1.055^2} + \frac{30}{1.055^3} + \frac{30}{1.055^4} + \frac{30}{1.055^5} + \frac{1030}{1.055^6} = 875.11\,\text{EUR}$$ (2 points)

$$\text{Value}_{DebtOffering} = 960 - 875.11 = 84.89\,\text{EUR}$$ (1 point)

(or Total Value of Debt Offering = 84.89 · 5,000,000 = 424,450,000, or 424,441,289 with exact numbers)

The current market value of the debt component of the convertible offering is 875.11 EUR per bond and the company appears to lock in a financing advantage of 84.89 EUR. However, this

convertible still should not be considered as 'cheap' debt financing in that the firm also sells an equity option to investors. Hence, the convertible bond consists of a debt and an equity component and the financing advantage of 84.89 EUR actually reflects the value of the option and therefore is equal to the value of the equity component. (3 points)

b2)
Calculate the asset beta of Frontpage based on the old capital structure (50% debt):

$$\beta_{Asset} = \beta_{Equity} / \left(1 + (1-t) \cdot \frac{D}{E}\right) = 1.3 / \left(1 + (1-0.4) \cdot 1\right) = 0.81$$ (2 points)

Releverage the beta to reflect the new debt level of 60% (debt to assets) which corresponds to a ratio of 1.5 (60/40) debt to equity:

$$\beta_{Equity} = \beta_{Asset} \cdot \left(1 + (1-t) \cdot \frac{D}{E}\right) = 0.81 \cdot \left(1 + (1-0.4) \cdot 1.5\right) = 1.54$$ (2 points)

Calculate the new cost of equity capital using the CAPM:

$$r_{Equity} = 3\% + 1.54 \cdot (12\% - 3\%) = 16.85\%$$ (w/o rounding 16.89%) (2 points)

Adjust the cost of equity capital for the reduced liquidity premium of 1.5%:

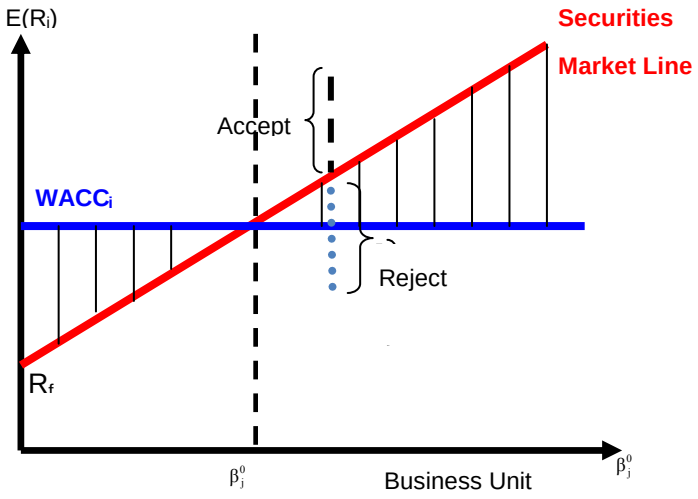
$$r_{Equity} = 16.85\% + 1.50\% = 18.35\%$$ (w/o rounding 18.39%) (2 points)

Calculate the weighted average cost of capital:

$$r_{WACC} = 0.4 \cdot 18.35\% + 0.6 \cdot (3 + 2.50\%) \cdot (1 - 0.4) = 9.32\%$$ (w/o rounding 9.34%) (2 points)

Thus, the financing transaction proposed did achieve its goal. It lowers the weighted average cost of capital and raises firm value. (1 point)

c)
c1)
In capital budgeting, the relevant risk of a project is its contribution to the risk of the entire firm. Therefore, the incremental cash flows of the project need to be discounted at the project-specific cost of capital which takes this into account. Graphically this can be shown as follows:



(Graph 3 points)

Thus, even if a given project earns the WACC it should not be realized if it does not earn its project-specific cost of capital. Applying these insights to the CEO's projects, the project-specific beta has to be used in order to calculate the cost of capital and to evaluate the project. The project's beta equals 1.6. (Explanation 2 points)

c2)
By keeping a beta at 1.3 and using the CAPM, the cost of equity capital is:

$$r_{Equity} = 3\% + 1.3 \cdot (12\% - 3\%) = 14.70\%$$

Then, the cost of equity capital must be adjusted by the liquidity premium of 2.5%. So, the cost of equity capital is:

$$r_{Equity} = 3\% + 1.3 \cdot (12\% - 3\%) + 2.50\% = 17.20\%$$

And WACC = $k_D(1 - t_c)\frac{D}{V} + k_E\frac{E}{V} = 5.5\% \cdot (1 - 0.4) \cdot 0.5 + 17.2\% \cdot 0.5 = 10.25\%$

With a new project's beta of 1.6 and the liquidity premium included, the cost of equity capital is:

$$r_{Equity} = 3\% + 1.6 \cdot (12\% - 3\%) + 2.50\% = 19.90\%$$

And WACC = $k_D(1 - t_c)\frac{D}{V} + k_E\frac{E}{V} = 5.5\% \cdot (1 - 0.4) \cdot 0.5 + 19.9\% \cdot 0.5 = 11.60\%$

The impact of the project on shareholder value is given by its net present value.

With a cost of equity capital of 10.25% (Result in EUR 1,000)

$$\begin{aligned} Value_{expansion} &= -1{,}800{,}000 + \frac{105{,}000}{1 + 0.1025} + \frac{110{,}000}{(1 + 0.1025)^2} + \frac{120{,}000}{(1 + 0.1025)^3} + \frac{1}{(1 + 0.1025)^3} \cdot \frac{120{,}000 \cdot 1.05}{0.1025 - 0.05} \\ &= 266{,}198\,EUR \end{aligned}$$

With a cost of equity capital of 11.60% (Result in EUR 1,000)

$$\begin{aligned} Value_{expansion} &= -1{,}800{,}000 + \frac{105{,}000}{1 + 0.1160} + \frac{110{,}000}{(1 + 0.1160)^2} + \frac{120{,}000}{(1 + 0.1160)^3} + \frac{1}{(1 + 0.1160)^3} \cdot \frac{120{,}000 \cdot 1.05}{0.1160 - 0.05} \\ &= -157.741\,EUR \end{aligned}$$

(6 points for the calculations)

This means that in contrast to the CEO's projections (Project value of EUR 266,198,000) this expansion project is not profitable (Negative project value of EUR 157,741,000) under the assumptions given and its implementation would reduce firm value (1 point)

[Note for the correctors:
Only the values with a beta of 1.6 are required. Full points should be given for a result of -157.741. The other numbers are just for explanation]

S Q5 March12 : Equity valuation and analysis

a)
A number of factors render the P/E ratio a method widely used for stock valuation by investors and analysts.

1. The P/E ratio is intuitively understandable and easy to explain as the relative cost of a stock. It represents the price of a share per dollar of expected earnings (P_0/E_1) or per dollar of the current (or most recent) period's earnings (P_0/E_0). The P/E ratio method of equity valuation is similar to valuation of a residential property based on its covered area or the number of bedrooms.

2. The P/E ratio method of valuing or comparing stocks eliminates the need for computing financial ratios and making assumptions about risk, payout ratios, and growth, all of which are needed for estimating the value of a stock in the discounted cash flow techniques.

3. The P/E ratio is easy to compute for most stocks because most firms report earnings (per share) in their income statements. Readily available market price data makes comparisons across firms easy.

4. The P/E ratio is used as proxy for a number of stock/firm characteristics such as relative risk, investor required rate of return, and expected growth in earnings.

(each correct answer 2 points – max. 6 points)

b)
There are a number of potential problems with the estimation of P/E ratios that make comparing the relative values of stocks using the P/E ratios troublesome.

1. The P/E ratio calculation is meaningless when the earnings of a firm are negative. While using the average earnings per share in the recent past as a proxy for current earnings can reduce this problem, it cannot be eliminated.

2. The volatility of a firm's earnings can cause wild swings in the P/E ratio estimates from period to period. The P/E ratio of a cyclical firm may be unusually high during recession and low during economic expansion.

3. While a firm's earnings are generally influenced by the current economic environment, the price of the stock reflects the expected performance of the firm. Often, the P/E ratio calculated using unusually high or low earnings result in absurd P/E ratios.

4. P/E ratios vary across industries and firms. When comparing P/E ratios across firms, ignoring differences in risks, payout ratios, and growth rates can result in incorrect conclusions about the relative attractiveness of different stocks.

5. Often investors compare P/E ratios over time. P/E ratios rise as interest rates decline (because the required rate of return declines.) P/E ratios also rise as equity risk premium declines (again, because the required rate of return declines.) Comparing P/E ratios across different periods without adjusting for differences in inflation rates, interest rates, and equity risk premiums can render P/E ratio comparisons erroneous.

(each correct answer 2 points – max. 6 points)

c)
The required rate of return can be calculated using the capital asset pricing model (CAPM):

	QuickCart Stores	HiClass Apparels
Required rate of return, r, using CAPM $= Rf + \beta \cdot (Rm - Rf)$	12.30%	11.40%

Where,
Rf, the risk-free rate of return
Rm, the expected return on the market (S&P500) portfolio
r, the required rate of return (4 points)

d)
Watch consecutive errors:

The P_0/E_0 ratios can be calculated as follows:

We know that

$$P_0 = \frac{DPS_1}{(r-g)}, \text{ and}$$

$$DPS_1 = EPS_1(\text{Payout ratio}), \text{ or}$$

$$DPS_1 = EPS_0(1+g)(\text{Payout ratio})$$

So,

$$P_0 = \frac{EPS_0(1+g)(\text{Payout ratio})}{(r-g)}$$

Rearranging, we get

$$\frac{P_0}{EPS_1} = \frac{\text{Payout ratio}}{(r-g)} \quad \text{and}$$

$$\frac{P_0}{EPS_0} = \frac{\text{Payout ratio}(1+g)}{(r-g)}$$

	QuickCart Stores	HiClass Apparels
Retention ratio = (1 - payout ratio)	0.68	0.35
Expected growth rate, g = Retention rate x ROE	9.52%	5.60%
$\frac{P_0}{EPS_0} = \frac{\text{Payout ratio} \cdot (1+g)}{(r-g)}$	12.61	11.83

Where, ROE is the return on equity

(7 points)

e)

Watch consecutive errors:

The implied growth rate in HiClass's PE ratio can be computed as follows:

P_0/EPS_1 =	20
Payout ratio	65%
Required rate (from C)	11.40%
$\frac{P_0}{EPS_1} = \frac{Payout\ ratio}{(r-g)}$	
Or, implied growth rate, $g = r - \frac{Payout\ ratio}{\frac{P_0}{EPS_1}}$	$0.1140 - \frac{0.65}{20}$ $= 0.0815 = 8.15\%$

(6 points)

f)

The price-to-earnings ratio is a function of a number of factors:

1. In the P/E ratio calculation formula the payout ratio is in the numerator. As the payout ratio increases, the P/E ratio increases. Everything else being equal, HiClass's higher payout ratio would result in a higher P/E ratio.

2. The higher the risk associated with a stock, everything else being equal, the greater the required rate of return. The required rate of return, r, is in the denominator of the P/E ratio formula. Therefore, the higher the required rate of return, the lower the P/E ratio. QuickCart has higher risk as measured by beta. All else being equal, this would result in a lower P/E ratio than QuickCart.

3. Expected growth rate in earnings affects the denominator in the P/E ratio calculation. The higher the growth rate in earnings, the smaller the denominator (r – g) (and the larger the numerator for P_0/E_1 calculation), and therefore, the higher the P/E ratio. QuickCart's growth rate of 9.50% is significantly higher than that of HiClass and would result in a higher P/E ratio for QuickCart.

4. The higher growth rate of QuickCart more than offsets the higher payout ratio and lower risk of HiClass, resulting in a higher P/E for QuickCart.

(each correct answer 2 points – max. 6 points)