UNIVERSITETET I AGDER

EXAM

Course:	**BE 316 Valuation**
Date:	22 May 2015
Time:	0900 - 1300
Number of pages:	6
Number of exercises:	5
Exam aids:	Calculator with empty memory (no communication) Dictionary
General information:	All questions are to be answered. You may answer the exam in English or Norwegian.

Exercise 1 (25%)

Brew Dog Breweries Inc (BDB) is considering investing in a new production unit to launch a new brand of beer – "The bearded lady". The investment cost is $100,000, which will be depreciated over five years using straight-line depreciation. At the end of 5 years, the production unit is expected to be sold for $10,000. Estimated sales revenue for "The bearded lady" is given in the table below:

	Year				
	1	2	3	4	5
Sales revenue	$50 000	$80 000	$150 000	$100 000	$80 000

There will be no need for investment in net working capital for this project. Variable costs are estimated to be 30% of sales revenue and fixed costs are $10,000 per year. The company faces a 20% corporate tax rate. BDB uses a 9% discount rate for its investments.

a) Compute the expected free cash flow for each of the next five years from this project. What is the net present value of this project? Does it create shareholder value? Should BDB undertake this project?

Exercise 2 (25%)

Amarindo Inc (AMR), is newly listed on the stock exchange. You are doing a valuation analysis of AMR for a client that is interested in buying the entire firm. Because the firm has only been listed on the stock exchange for a short time, you do not have an accurate assessment of AMR's equity beta. However, you do have the following data for UAL, a comparable firm in the same industry:

	UAL
Equity beta	1.8
Debt beta	0.3
Debt/Equity ratio (D/E)	2

AMR has D/E ratio of 1, which is expected to remain stable, and you assume the company's debt beta is 0.2. AMR's corporate tax rate is 20%, the risk-free rate is 2%, and the expected return on the market portfolio is 7%. Base your answers on the CAPM.

a) What is the unlevered equity beta of UAL?
b) Use the information of UAL to estimate AMR's levered equity beta. What is AMR's required rate of return for equity?
c) What is AMR's weighted average cost of capital (WACC)?

You forecast AMR's total free cash flow in the coming year to be $15 million, and you expect the firm's free cash flows to grow by 1.2% per year in all years thereafter.

d) What is the value of AMR (the entire firm)?

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Exercise 3 (30%)

An analyst has estimated the following pro-forma income statements and balance sheets for the years 2015-2019 for the company SILIPHONE Inc.:

	2014 (actual)	2015	2016	2017	2018	2019
INCOME STATEMENT						
Revenues		19 726 203	20 909 775	22 164 361	23 494 223	24 903 876
Cost of goods sold		12 789 155	13 556 504	14 369 894	15 232 088	16 146 013
Gross profit		6 937 048	7 353 271	7 794 467	8 262 135	8 757 863
Operating expenses:						
Fixed operating expenses		1 000 000	1 000 000	1 000 000	1 000 000	1 000 000
Variable operating expenses		3 169 343	3 359 504	3 561 074	3 774 738	4 001 223
Depreciation expense		800 214	848 227	899 121	953 068	1 010 252
Net operating income		1 967 491	2 145 541	2 334 273	2 534 329	2 746 389
Interest expense		442 862	438 721	429 826	416 309	397 717
Earnings before taxes		1 524 629	1 706 820	1 904 447	2 118 021	2 348 673
Taxes (40%)		609 852	682 728	761 779	847 208	939 469
Net income		914 777	1 024 092	1 142 668	1 270 813	1 409 204
Dividends paid		100 000	100 000	100 000	100 000	100 000
BALANCE SHEET						
Cash	372 193	374 798	397 286	421 123	446 390	473 174
Accounts receivable	4 056 899	4 221 407	4 474 692	4 743 173	5 027 764	5 329 429
Inventory	6 141 177	6 450 468	6 837 496	7 247 746	7 682 611	8 143 568
Current assets	10 570 268	11 046 674	11 709 474	12 412 042	13 156 765	13 946 171
Net property, plant and equipment	8 002 139	8 482 267	8 991 203	9 530 675	10 102 516	10 708 667
Total assets	18 572 407	19 528 941	20 700 677	21 942 718	23 259 280	24 654 837
Accounts payable	4 400 050	4 497 574	4 767 429	5 053 474	5 356 683	5 678 084
Short-term debt	4 094 118	4 004 419	4 244 684	4 499 365	4 769 327	5 055 487
Current liabilities	8 494 168	8 501 993	9 012 113	9 552 840	10 126 010	10 733 571
Long-term debt	2 232 483	2 263 018	1 985 688	1 627 898	1 182 333	641 137
Total liabilities	10 726 651	10 765 011	10 997 801	11 180 738	11 308 343	11 374 708
Deferred income taxes	185 186	198 583	213 438	229 873	248 018	268 007
Owners' equity	7 660 570	8 565 347	9 489 439	10 532 107	11 702 919	13 012 123
Total liabilities and owners' equity	18 572 407	19 528 941	20 700 677	21 942 718	23 259 280	24 654 837

The analyst tells you that Cash is part of the firm's operating current assets. The firm's interest bearing debt consists of Short-term debt and Long-term debt. The analyst is using a weighted average cost of capital (WACC) of 10% and he believes the long-term growth rate in free cash flows will equal 5%.

a) Estimate firm free cash flows for the years 2015-2019.
b) Compute both the enterprise value and the equity value of SILIPHONE.

Exercise 4 (10%)

The company BayLink is going public (= gets its shares listed on a stock exchange) next month. The following numbers are from BayLink's latest financial statements (31 December 2014):

EBITDA	$	800 000 000
Cash	$	430 000 000
Debt	$	10 000 000
Net income	$	400 000 000
Shares outstanding		271 219 643
EPS	$	1.47

BayLink's Chief Financial Officer (CFO) has gathered the following key numbers from 4 companies that are considered to be comparable to BayLink:

Financial Information	Company A	Company B	Company C	Company D
2014 Shares Outstanding	$ 159 399 000	$ 500 000 000	$ 646 819 000	$ 10 800 000 000
2014 Fiscal Close Stock Price	$ 10.00	$ 45.03	$ 64.61	$ 25.64
Market Capitalization	$ 1 593 990 000	$ 29 521 758 060	$ 41 790 975 590	$ 276 912 000 000
Short Term Debt	$ 900 000	$ -	$ 2 800 000	$ -
Long Term Debt	$ -	$ 750 000 000	$ 124 500 000	$ -
Cash & Equivalents	$ 349 740 000	$ 713 539 000	$ 1 381 513 000	$ 6 438 000 000
Short Term Investments	$ 89 088 000	$ 595 975 000	$ 340 576 000	$ 42 610 000 000
EBITDA	$ 218 100 000	$ 455 300 000	$ 818 200 000	$ 14 656 000 000
Net Income	$ (62 200 000)	$ 237 900 000	$ 441 800 000	$ 9 993 000 000
Calculated EPS	-0.39	0.48	0.68	0.93

The CFO asks for your help. Based on the data above, she wants you to compute an estimate of the value of BayLink's share. Apply the method of multiples based on both the P/E-ratio and the enterprise value to EBITDA ratio when helping the CFO. Use the average of all your calculations as your best guess for the value of BayLink's share.

Exercise 5 (10%)

Venture Investment Partners (VIP) is looking at the possible investment of $1 million in an early-stage company (Speedco). Given the stage of the investment, VIP requires a 45% annual rate of return. Speedco earned $750,000 in EBITDA last year, and this amount is expected to grow at a rate of 30% per year over the next five years. Companies such as Speedco are currently being valued at five times EBITDA, and VIP thinks this is a reasonable multiple for the valuation of the firm in five years.

What fraction of Speedco does VIP need to own at the end of five years in order to realize the required rate of return on its investment?

Formula sheet

$$PV = \sum_{t=1}^{N} \frac{C_t}{(1+k)^t}$$

$$I_0 = \sum_{t=1}^{N} \frac{C_t}{(1+IRR)^t}$$

$$PV_{annuity} = \sum_{t=1}^{N} \frac{C}{(1+k)^t} = \frac{C}{k}\left(1 - \frac{1}{(1+k)^N}\right)$$

$$PV_{perpetuity} = \sum_{t=1}^{\infty} \frac{C}{(1+k)^t} = \frac{C}{k}$$

PV: Present value
C_t: Cash flow at time t
k: Required rate of return
I_0: Investment outlay
IRR: Internal rate of return

$$k_{WACC} = k_d(1-T)w_d + k_p w_p + k_e w_e$$

$$k_e = k_{rf} + \beta_e(k_m - k_{rf})$$

$$\mathrm{k_p} = \frac{Div_p}{P_p}$$

$$P_b = \sum_{t=1}^{N} \frac{CPN}{(1+YTM)^t} + \frac{F}{(1+YTM)^N}$$

$$\beta_E = \beta_U\left(1 + \frac{D}{E}\right) - \beta_D\left(\frac{D}{E}\right)$$

$$\beta_U = \frac{\beta_E + \beta_D\left(\frac{D}{E}\right)}{1 + \left(\frac{D}{E}\right)}$$

k_{WACC}: **W**eighted **A**verage **C**ost of **C**apital,
k_d, k_p, k_e: required rate of return for **d**ebt, **p**referreds and **e**quity
T: Tax rate
w_d, w_p, w_d: capital structure weights for **d**ebt, **p**referreds and **e**quity
k_m: Expected return on the market portfolio
β_e: Beta value of equity
k_{rf}: risk free rate of return
P_p: Price preferred stock
Div_p: Dividend preferred stock
P_b: Bond price
F: Face value
CPN: Coupon payment
YTM: Yield to maturity
$\beta_E, \beta_D, \beta_U$: Beta of **E**quity, **D**ebt and **U**nlevered equity
D, E: Market value of **D**ebt and **E**quity

$$FCF = \underbrace{EBIT \times (1-T)}_{NOPAT} + DA - WC - CAPEX$$

$$EBITDA = FCF + (T \times EBIT + CAPEX + WC)$$

$$EVA_t = NOPAT_t - \underbrace{Invested\ Capital_{t-1} \times WACC}_{Capital\ Charge}$$

FCF: Free cash flow
$EBIT$: Earnings before interest and taxes
$EBITDA$: Earnings before interest, taxes, depreciation and amortization
T: Tax rate
$CAPEX$: Capital expenditures
WC: Increase in working capital
EVA: Economic value added

$$EV = EBITDA \times EBITDA\ Multiple$$
$$P = EPS \times P/E$$
$$P_0 = \frac{D_0(1+g)}{k-g}$$
$$P_0 = \frac{EPS_0(1-b)(1+g)}{k-g}$$
$$P_0 = \frac{EPS_0(1-b_1)(1+g_1)}{k-g_1}\left(1-\frac{(1+g_1)^n}{(1+k)^n}\right) + \frac{EPS_0(1-b_2)(1+g_1)^n(1+g_2)}{k-g_2}\left(\frac{1}{(1+k)^n}\right)$$

EV: Enterprise value
P : Stock price
EPS : Earnings per share
P/E: Price-earnings ratio
D: Dividend
g: Growth rate
g_1, g_2: Growth rate in period 1 and 2
n: End of first growth period

$$EV = \sum_{t=1}^{N} \frac{FCF_t}{(1+k_{WACC})^t}$$

$$EV = \sum_{t=1}^{PP} \frac{FCF_t}{(1+k_{WACC})^t} + \frac{FCF_{PP}(1+g)}{k_{WACC}-g}\left(\frac{1}{1+k_{WACC}}\right)^{PP}$$

$$APV = \sum_{t=1}^{PP} \frac{FCF_t}{(1+k_U)^t} + \sum_{t=1}^{PP} \frac{Interest\ expense \times T}{(1+k_{rf})^t} + \frac{FCF_{PP}(1+g)}{k_{WACC}-g}\left(\frac{1}{1+k_U}\right)^{PP}$$

EV: Enterprise value
APV: Adjusted present value method
PP: Planning period
k_{WACC}: Weighted average cost of capital
k_U= Unlevered cost of capital
k_{rf}: risk free rate