

Name, matriculation number \_\_\_\_\_

**Examination:** 20029 – Corporate Finance **Winter Term 2009/2010**  
**Examiner:** Prof. Dr. Peter Reichling  
**Time available:** 60 minutes

**Aids permitted:** non-programmable pocket calculators;  
 English dictionaries without any markings.

The examination is comprised of **two** problems. All of them are to be solved. Answers must be given in **English**. Good luck!

**Problem 1 (30 Points)**

ABC Corporation shows the following forecast balance sheet and income statement data (in millions of dollars):

Balance Sheet

	2011	2012	2013	2014
<b>Assets:</b>				
Intangible assets	200	250	220	240
Property, plant, equipment	800	880	950	900
Non-current financial assets	300	350	330	360
<b>Non-current assets</b>	<b>1,300</b>	<b>1,480</b>	<b>1,500</b>	<b>1,500</b>
Inventories	150	200	170	180
Trade receivables	200	210	230	200
Current financial assets	400	420	440	410
Securities	250	270	280	290
Cash and cash equivalents	300	300	280	320
<b>Current assets</b>	<b>1,300</b>	<b>1,400</b>	<b>1,400</b>	<b>1,400</b>
Balance sheet total	2,600	2,880	2,900	2,900
<b>Equity and Liabilities:</b>				
Share capital	160	188	190	190
Additional paid-in capital	500	532	560	560
Retained Earnings	50	80	100	120
<b>Equity</b>	<b>710</b>	<b>800</b>	<b>850</b>	<b>870</b>
Provisions for pensions	90	150	150	200
Non-current financial liabilities	600	680	600	580
<b>Non-current liabilities</b>	<b>690</b>	<b>830</b>	<b>750</b>	<b>780</b>
Other current provisions	200	240	370	400
Trade payables	200	210	230	200
Current financial liabilities	800	800	700	650
<b>Current liabilities</b>	<b>1,200</b>	<b>1,250</b>	<b>1,300</b>	<b>1,250</b>
Balance sheet total	2,600	2,880	2,900	2,900

Income Statement

	2011	2012	2013	2014
Sales	2,000	2,500	2,800	3,300
Cost of goods sold	600	650	670	700
<b>Gross profit</b>	<b>1,400</b>	<b>1,850</b>	<b>2,130</b>	<b>2,600</b>
Marketing and selling expences	50	55	60	70
Research and development expences	100	120	120	120
<b>Operating result</b>	<b>1,250</b>	<b>1,675</b>	<b>1,950</b>	<b>2,410</b>
Interest income	30	45	40	45
Interest expence	189	208	205	203
<b>Profit before tax</b>	<b>1,091</b>	<b>1,512</b>	<b>1,785</b>	<b>2,252</b>
Taxes on income	327.3	453.6	535.5	675.6
<b>Net income</b>	<b>763.7</b>	<b>1,058.4</b>	<b>1,249.5</b>	<b>1,576.4</b>

20 % of the income statement position cost of goods sold include depreciation.

Additionally the following data of ABC is given:

Expected Market Rate of Return	15 %
Risk-free Rate of Return	6 %
Beta of ABC	1.4
ABC's Cost of Debt	10 %
ABC's Debt-Equity Ratio (in market values)	1/4

The company is taxed at the rate of 30 %.

- Compute the cost of equity of ABC.
- Calculate the weighted average cost of capital of this company.
- Compute the forecast free cash flows for the next four years. Non-current assets in 2010 amount to 1,120 million dollars. Working Capital in 2010 is 50 million dollars.
- Assuming constant free cash flows starting from 2014, calculate the value of the firm and its equity value. The debt value in 2010 amounts to 1,550 million dollars.

**Problem 2 (30 Points)**

BBB corporation raised a loan from a bank two years ago. This loan was issued as a zero bond with an initial maturity of five years and a repayment of two million dollars. The assets of the corporation are worth three million dollars. Their expected (continuously compounded) rate of return amounts to 10 %. The volatility of total assets is 30%. The current term structure of (continuously compounded) interest rate is the following:

Maturity	1 year	2 years	3 years	4 years	5 years
Spot Rate (p.a.)	3.00%	3.50%	4.00%	4.50%	5.00%

- Illustrate and describe the loan and the equity of the corporation as a portfolio of default-free bonds and options.
- Compute the current value of the loan using Merton's model.
- What is the required rate of return of the bank? Interpret this rate of return in comparison to the appropriate spot rate.
- Compute the default probability of this loan and its expected loss.



## Cumulative Standard Normal Distribution

$x$	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7034	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9773	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9983	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9990	0.9993	0.9995	0.9997	0.9998	0.9998	0.9999	0.9999	1.0000