University of Stavanger (UiS)
Exam MØA 370 Valuation
Fall 2022.

Permitted Material: Calculator

The number in brackets is the points for each problem. The points sum to 100.

Exercise 1. *Short answer questions* [10]
For each of the below questions, give a short answer.

1. Suppose the firm you are valuing for the last two years have had negative EBIT. Should you use these as the basis for projecting the future earnings of the firm?
2. What are the two most typical methods for estimating a terminal value (horizon value)?
3. When we estimate the firm's cost of capital, we typically first estimate the equity cost of capital by finding a relevant beta. If a firm is traded on a stock exchange we use historical data on returns to estimate beta. What do we do if the firm's stock is not traded on an exchange?
4. What is the most common source of *goodwill* in a corporation's balance sheet?
5. There are three methods for dealing with interactions between investment decisions and financing: Adjusted Present Value, Flow to Equity, and WACC. Which of these account for expected bankruptcy costs?
6. Firms do at times repurchase shares. How do such repurchases affect corporate valuations?
7. In valuations, what is the most important insight from sensitivity analysis?
8. (1) Under what circumstances would it be appropriate for a firm to use different costs of capital for its different operating divisions? (2) If the overall firm WACC were used as the hurdle rate for all divisions, would the riskier divisions or the more conservative divisions tend to get most of the investment projects? Why?

Exercise 2. *Inflation (true/false)* [2.5]
Answer true or false to the following statements relating to the effect of inflation on cash flows and value. If you say something is false, give a short reason why.

1. Discounting nominal cash flows at the real discount rate will result in too low an estimate of value.
2. Discounting real cash flows at the nominal discount rate will result in too low an estimate of value.
3. If done right, the value estimated should be the same if either real cash flows are discounted at the real discount rate or nominal cash flows are discounted at the nominal discount rate.
4. If companies can raise prices at the same rate as inflation, their value should not be affected by changes in the inflation rate.

5. Inflation should increase the value of stocks because it increases expected future cash flows.

Exercise 3. *Growth estimation* [2.5]

Consider estimating growth from fundamentals for Deutsche Bank. In 2007, Deutsche Bank reported net income of 6.51 billion euros on a book value of equity of 33,475 billion euros at the start of the year (end of 2006). The resulting return on equity is 19.45%.

$$\text{Return on Equity} = \frac{\text{Net Income}_{2007}}{\text{Book value of equity}_{2006}} = 19.45\%$$

In 2007, Deutsche Bank paid out 2.146 billion euros to equity investors. The resulting retention ratio is 67.03%

$$\text{Retention ratio} = 1 - \frac{\text{Dividends}}{\text{Net Income}} = 1 - \frac{2.146}{6.510} = 67.03\%.$$

1. Find an estimated growth rate for Deutsche Bank.

Exercise 4. *MRP* [2.5]

What are sources for estimates of the *market risk premium (MRP)*?

Exercise 5. *Growth Rates* [2.5]

The growth rates from historical earnings, analysts projections, and fundamentals, can often be very different. The differences can be best explained by which of the following statements

(a) The past is not always a good indicator of the future.

(b) Analysts are biased toward making optimistic estimates of growth.

(c) The inputs used to estimate fundamental growth reflect what happened last year rather than what we expect will happen in the future.

(d) All of the above.

Exercise 6. *Growth rates (short answer)* [10]

The following are a number of valuation scenarios, where multiple estimates of growth are available. Specify how you weight the different growth rates and why.

1. A cyclical firm, whose earnings have dropped significantly (historical growth rate is negative) as a consequence of a recession, but which you believe has bottomed out and is in the process of recovering. The firm is heavily followed by analysts, who have a good track record in forecasting earnings growth.

2. A troubled firm, whose earnings have dropped significantly because of a combination of bad luck and bad management, but which is now restructuring. You have fairly good information on the form the restructuring will take and its expected impact. Analysts follow the firm, but their track record is spotty.

3. A healthy firm, where the estimates of growth from history, analysts, and fundamentals are fairly close.

4. A firm, which has a long and fairly reliable history of earnings growth, but which has just sold off three divisions (comprising almost half of the market value of the firm). Analysts follow the stock, but base forecasts primarily on historical growth.

Exercise 7. *Choice of horizon in valuation* [5]

Assume that you are analyzing two firms, both of which are enjoying high growth. The first firm is Earthlink Network, an Internet service provider, which operates in an environment with few barriers to entry and extraordinary competition. The second firm is Biogen, a biotechnology firm that is enjoying growth from two drugs for which it owns patents for the next decade. Assuming that both firms are well managed, which of the two firms would you expect to have a longer high-growth period? (Justify your answer)

1. Earthlink Network
2. Biogen
3. Both are well-managed and should have the same high-growth period.

Exercise 8. *Transaction costs* [2.5]

Consider the following quote

> "If you buy stock in a publicly traded firm and then change your mind and decide to sell, you face modest transaction costs. If you buy a private business and change your mind, it is far more difficult to reverse your decision."

1. Is this correct?
2. If it is, how can one account for this issue in valuations?

Exercise 9. *PE ratio* [2.5]

Assume that you are reading an equity research report in which a buy recommendation for a company is being based on the fact that its PE ratio is lower than the average for the industry. Implicitly what is the underlying assumption or assumptions being made by the analyst?

(a) The sector itself is, on average, fairly priced.

(b) The earnings of the firms in the group are being measured consistently.

(c) The firms in the group are all of equivalent risk.

(d) The firms in the group are all of at the same stage in the growth cycle.

(e) The firms in the group have similar cash flow patterns

(f) All of the above

Exercise 10. *Forestry/Paper industry* [15]

The following are the betas of the equity of four forestry/paper product companies, and their debt/equity ratios.

Company	beta	Debt/Equity ratio
Weyerhauser	1.15	33.91%
Champion International	1.18	54.14%
International Paper	1.05	45.50%
Kimberly-Clark	0.91	11.29%

All the firms face a corporate tax rate of 40%.

1. Estimate the unlevered beta of each firm. What do the unlevered betas tell you about these firms?

2. Assume now that Kimberly Clark is planning to increase its debt/equity ratio to 30%. What will its new beta be?

3. If you were valuing an initial public offering in the paper products area, what beta would you use in the valuation? (Assume that the firm going public plans to have a debt/equity ratio of 40%.)

Exercise 11. *South Tel* [15]

South Tel communications is considering the purchase of a new software management system. The system is called B-image and it is expected to reduce drastically the amount of time that company technicians spend installing new software. South Tel's technicians currently spend 6,000 hours per year on installations, which costs South Tel $25 per hour. The owners of the B-image system claim that their software can reduce time on task by a least 25%. The system requires an initial investment of $55,000 and an additional investment of $10,000 for technician training on the new system. Annual upgrades will cost the firm $15,000 per year. The tax treatment of software purchases sometimes calls for amortization of the initial cost over time; sometimes the cost can be expensed in the year of the purchase. Before the tax experts are consulted and for purposes of this initial analysis, South Tel faces a 30% tax rate and uses a 9% cost of capital to evaluate projects of this type.

1. Assume that South Tel has sufficient taxable income from other projects so that it can expense the cost of the software immediately. What are the free cash flows for the project for years zero and one?

Exercise 12. *Eastman Kodak's restructuring* [20]

In the face of disappointing earnings results and increasingly assertive institutional stockholders, Eastman Kodak was considering a major restructuring in 1993. As part of this restructuring, it was considering the sale of its health division, which earned $560 million in earnings before interest and taxes in 1993, on revenues of $5.285 billion. The expected growth in earnings was expected to moderate to 6% between 1994 and 1998, and to 4% after that. Capital expenditures in the health division amounted to $420 million in 1993, while depreciation was $350 million. Both are expected to grow 4% a year in the long term. Working capital requirements are negligible. Assume a market risk premium of 5.5%.

The average beta of firms competing with Eastman Kodak's health division is 1.15. While Eastman Kodak has a debt ratio (D/(D+E)) of 50%, the health division can sustain a debt ratio (D/(D+E)) of only 20%, which is similar to the average debt ratio of firms competing in the health sector. At this level of debt, the health division can expect to pay 7.5% on its debt, before taxes. (The tax rate is 40%, and the treasury bond rate is 7%.)

1. Estimate the cost of capital for the division.

2. Estimate the value of the division.

Exercise 13. *Garmin case* [10]

In the Garmin case we calculated a number of scenarios for cost of capital.

Scenario 1

Debt Ratio (D/V)	0.00%	15.00%	30.00%	45.00%	60.00%	75.00%
Cost of debt	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
D/E	0.00%	17.65%	42.86%	81.82%	150.00%	300.00%
Levered beta	1.200	1.367	1.606	1.976	2.622	4.044
Cost of equity	8.30%	9.14%	10.33%	12.18%	15.41%	22.52%
Cost of Capital	8.30%	8.12%	7.94%	7.76%	7.59%	7.41%

Scenario 2

Debt Ratio	0.00%	15.00%	30.00%	45.00%	60.00%	75.00%
Cost of debt	3.00%	3.10%	3.50%	4.10%	5.10%	6.30%
D/E	0.00%	17.65%	42.86%	81.82%	150.00%	300.00%
Levered beta	1.200	1.367	1.606	1.976	2.622	4.044
Cost of equity	8.30%	9.14%	10.33%	12.18%	15.41%	22.52%
Cost of Capital	8.30%	8.13%	8.06%	8.16%	8.58%	9.36%

Scenario 3

Debt Ratio	13.00%	28.00%	34.00%	42.00%	57.00%	70.00%
Cost of debt	2.40%	2.80%	2.90%	3.90%	5.20%	8.50%
D/E	14.94%	38.89%	51.52%	72.41%	132.56%	233.33%
Levered beta	1.342	1.569	1.688	1.886	2.457	3.412
Cost of equity	9.01%	10.14%	10.74%	11.73%	14.58%	19.36%
Cost of Capital	8.08%	7.92%	7.87%	8.10%	8.61%	10.51%

1. One of these scenarios were deemed to be unrealistic. Which one? Why?

2. For the other two scenarios it was problematic to settle on which was the most relevant. Why?

   Discuss what additional information would have been helpful in choosing between these latter two scenarios.