POLITECNICO
MILANO 1863

Accounting, Finance & Control

Cost of Capital exercises

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Exercise 1 part 1

You are calculating the cost of equity of company Alpha that is not listed. This company manufactures high-quality lotions for skin treatment that are sold in specialized pharmacies and drug stores only with a doctor's prescription. The production plant is in Rome, where the headquarter is located. At present, the company sells all lotions in the French market because the mark-up is significantly higher than in Italy. The shareholder of company Alpha is a French family located in Paris whose financial investments are mainly located in France.

Looking at the last available financial reports, you know that:
• Assets = 4,000 k€
• Equity = 2,000 k€
• Non-financial liabilities = 1,700 k€
• Corporate tax rate = 50%

Exercise 1

Additionally, you know that:
- Italy's 2-year government bond yield = 1.35%
- Italy's 10-year government bond yield = 2.45%
- France's 2-year government bond yield = 0.74%
- France's 10-year government bond yield = 1.16%
- Germany's 2-year government bond yield = 0.48%
- Germany's 10-year government bond yield = 0.78%

operation more than one country! rules of euro zone

Additionally, you know that:
- FTSE MIB (Italy) is forecasted at 20%
- CAC 40 (France) is forecasted at 26%
- DAX (Germany) is forecasted at 28%

Exercise 1 part 2

Looking at the pharmaceutical industry, data show that:
- Average equity Beta = 1.08
- Average D/E = 14.8%
- Average tax rate = 48%

Looking at the biotechnology industry, data show that:
- Average equity Beta = 1.23
- Average D/E = 39.9%
- Average tax rate = 35%

Finally, you have data about two potential comparable companies that sell their products in the French market using pharmacies as their preferred channel.
- Company Gamma manufactures and sells all-purpose bandages. Assets are 1,000 k€; Equity is 300 k€; non-financial liabilities are 200k€; corporate tax rate is 50%
- Company Delta manufactures and sells safe toys for newborns. Assets are 800 k€; Equity is 240 k€; non-financial liabilities are 80k€; corporate tax rate is 50%

Exercise 1 – Solution

The cost of equity can be calculated using the <mark>CAPM method</mark>, i.e.,
<mark>$ke = rf + \beta L*(rm-rf)$</mark>

Italy's 2-year government bond yield = 1.35%
• Italy's 10-year government bond yield = 2.45%
• France's 2-year government bond yield = 0.74%
• France's 10-year government bond yield = 1.16%
• Germany's 2-year government bond yield = 0.48%
• Germany's 10-year government bond yield = 0.78%

rf = 0.78% because you must select the return of the least risky 10-year government bond of the currency area where the company is operating, meaning Germany for the Euro-zone

Exercise 1 – Solution

The cost of equity can be calculated using the CAPM method, i.e.,
$ke = rf + βL*(rm-rf)$

- FTSE MIB (Italy) is forecasted at 20%
- CAC 40 (France) is forecasted at 26%
- DAX (Germany) is forecasted at 28%

$rm = 26\%$ because you must select the market index that is representative of the market in which the company operates, meaning France where all products are sold

Exercise 1 – Solution

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we don't beta leverage so we can't do that.

Exercise 1 – Solution

Being company Alpha not listed, βL cannot be estimated through a regression of the stock returns against the market returns. In case of an unlisted company there are two strategies to infer βU: comparable companies or industry.

Companies Gamma and Delta cannot be argued as comparable ones because of (i) the very different product they sell and (ii) the different size and leverage. While for both companies, D/E is 2, D/E of company **Alpha is 0.15**, being aligned to the average D/E of the pharmaceutical industry (**D/E = 0.148**)

The product sold by company Alpha might be assumed comparable to products sold by the pharmaceutical industry. The biotechnology industry sells very different products, many of whom are not about healthcare but other industry like as agriculture, food production, recycling etc.

Exercise 1 – Solution

Considering the available data about the pharmaceutical industry,

$\beta U\_industry = \beta L\_industry / (1 + (1 - taxindustry) * (D/E)industry)$
= 1.08 / (1 + (1 – 48%) * (0.148)) = 1

Assuming that $\beta U\_company$ Alpha = $\beta U\_industry$

BL company Alpha = $\beta U\_industry$ * (1 + (1 – taxcompany Alpha) * (D/E)company

Alpha = 1 * (1 + (1 – 50%) * 0,15) = 1.075

Cost of equity = 0,78% + 1.075 * (26% - 0.78%) = 27.89% meaning about 28%

The cost of equity of company alpha is about 28% and the risk-free rate is 0.78%

Exercise 2

Company D is a company based and active in the Eurozone developing new series for sound streaming companies. In the following table, you can find an extract of the 2019 financial statement of Company D, reporting selected financial data.

Selected financial data [€]	December 31st, 2019
EBIT	30,000
Net Income	15,000
Interest expenses	7,000
Financial revenues	0
Debt	150,000
Reserves	60,000

Exercise 2

You also know that:
• The market value of Company D shares on 31st December 2019 is 1,1 € per share;
• Company D's equity is constituted by 100,000 shares (with a nominal value of 0,9 € per share);
• <mark>The cost of equity is 5,1%</mark>;
• The value of governments bonds (table below).

Americas	Yield
US	2.06%
Canada	1.91%
Mexico	3.19%
Brazil	3.90%
Europe	
Germany	0.78%
Britain	1.99%
France	1.16%
Italy	2.45%

Based on the available data, which is the value of WACC for Company D?

Exercise 2 – Solution

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EBIT	30,000
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EBT = 30 – 7 = 23

Tax = 23 – 15 = 8

Tax rate = 8 / 23 = 34.78%

Company D's equity is constituted by 100,000 shares (with a nominal value of 0,9 € per share)

Equity = 60 + 15 + 0.9 * 100 = 165

D + E = 165 + 150 = 315

Exercise 2 – Solution

Selected financial data [€]	December 31st, 2019
EBIT	30,000
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Interest expenses	7,000
Financial revenues	0
Debt	150,000
Reserves	60,000

Kd = 7 / 150 = 4.66%

به خاطر تکس شیلد پایین تره ... کاست ها نزدیکه و برای همین کم شده! ولی احتمال زیاد باید بینش باشه!

The cost of equity is 5,1%;
Ke = 5.1%

WACC = (150 / 315) * (1- 0.347) * 4,66 + (165 / 315) * 5.1 = 4.11