*Université catholique de Louvain*
*Finance – LECGE1332*

*Academic Year 2018-2019*

# TP 5: Risk and Return Analysis

**Exercise 1:**

Consider a firm A where the Equity is represented by 800.000 ordinary Shares that are exchangeable on the market at 30 euros each. The Debt, having nominal value 36.000.000 euros is represented by 20-years Corporate Bonds that will be paid back at the 100% of their face value and that give the right to receive a 8% yearly coupon. The price on the market of this bonds is 100. The firm adopt a constant policy of dividends and this year it granted a dividend of 2,791 euros per share. On the last 10 years, the dividend has showed a constant growth of 7,5%.
If the corporate tax is at 30%, what is the WACC (Weighted Average Cost of Capital) of firm A?

**Exercise 2:**

The correlation coefficient between the rate of return of a stock B and the rate of return of the market portfolio is 0.6. The standard deviations of the returns are respectively 0.50 for stock B and 0.40 for the market portfolio.

1) If one expects that the expected rate of return on the market portfolio is 12% and given that the rate of return on AAA-Government bonds is 4%, compute the expected return of the stock B.
2) What is the beta coefficient of a portfolio composed by 80% by stock B and 20% by the risk-free asset? What is the expected rate of return of this portfolio (two formulas are possible)?

**Exercise 3:**

You are considering how to invest part of your retirement savings.You have decided to put $ 300,000 into three stocks:
60 % of the money in Goldfinger (currently $ 29/share), 25 % of the money in Moosehead (currently $ 82/share), and the remainder in Venture Associates (currently $ 6/share). If Goldfinger stock goes up to $ 45/share, Moosehead stock drops to $ 58/share, and Venture Associates stock rises to $ 12 per share.

a. What is the new value of the portfolio?
b. What return did the portfolio earn?
c. If you don't buy or sell any shares after the price change, what are your new portfolio weights?

**Exercise 4:**

The analysts estimate the return of the market portfolio to be 12.5%. The risk free rate is 4%.
Consider two firms (A and B) that are in the same business sector.
They adopt a policy of constant policy of dividends with a retention rate of 40%. In this particular sector, the usual Return on Equity (ROE) is 12%. Financial analysts forecast, for the following year, the following Earnings Per Share (EPS) for the shares A and B:

| Asset | EPS | Beta |
|---|---|---|
| A | 6 | 1.2 |
| B | 4 | 0.8 |

Now, on the financial markets, the price of stock A is at 30 euros and that of stock B is at 60 euros. On the basis of the estimates of the analysts and on the base of beta coefficients, determine if these instruments are under- or over-valued (using the Security Market Line).

# EXERCISE SESSION 5

## EXERCISE 1:

$$WACC = \frac{E}{E+D} \cdot r_e + \frac{D}{E+D} \cdot r_d (1-\tau)$$

$E$ = value of equity ; $D$ = value of debt ; $r_e$ = cost of equity ; $r_d$ = cost of debt
$\tau$ = corporate taxe rate = 30%.

How do we compute the value of equity?

$E$ = # of shares . price
= 800 000 x 30 = 24 millions

How do we compute the value of debt?
$D$ = 36 millions

What's the WACC?

$$\frac{24}{24+36} \cdot r_e + \frac{36}{24+36} \cdot 0,08 \ (1-0,3)$$

$$r_e = \frac{Div}{P_0} + g \rightarrow \frac{2,791 \ (1+0,075)}{30} + 0,075 = 17,5\%$$

WACC = 10,36 %

## EXERCISE 2:

a) $CAPM = \frac{\sigma_B \cdot \rho_{B,M}}{\sigma_M} \cdot (R_M - r_f) + r_f = \frac{0,5 \times 0,6}{0,4} (0,12-0,04) + 0,04$

$= 10\%$

b) $\beta_p = 0,8 \beta_B + 0,2 \underbrace{\beta_f}_{0 \text{ risk}} = 0,8 \beta_B = 0,8 \times \frac{0,5+0,6}{0,4}$

$\beta_p = 0,6$

## EXERCISE 3 :

$$n_i = \frac{\% \text{ Stock} \times \text{total I}}{\text{original price stock}} \quad ; \quad P = \Sigma n_i \times \text{New price}$$

$$n_G = \frac{0,6 \times 300\,000}{29} = 6207 \text{ shares}$$

$n_M = 915$ shares $\qquad n_{VA} = 7500$ shares

a) What's the new value of the portofolio ?

$$\left.\begin{aligned} 6207 \times 45 &= 279\,315 \\ 915 \times 58 &= 53\,070 \\ 7500 \times 12 &= 90\,000 \end{aligned}\right\} \Sigma = 422\,385$$

b) What return did the portofolio earn?

$$\frac{422385 - 300\,000}{300\,000} = 40,8\,\%$$

c) What's the new portofolio weight ?

$$w_i = \frac{n_i \times \text{New price Stock}}{\text{new portofolio}}$$

$$w_G = \frac{6207 \times 45}{422385} = 66,13\% \qquad w_M = 12,56\% \qquad w_{VA} = 21,31\%$$

## EXERCISE 4 :

Rappel : $\quad CAPM \rightarrow E(R_i) = R_f + \beta_i \left[E(R_m) - R_f\right]$

$$\hookrightarrow \beta_i = \frac{cov(R_i, R_M)}{var(R_M)} = \frac{\sigma_{i,M}}{\sigma_M^2} = \frac{\sigma_i \times \rho_{iM}}{\sigma_M}$$

$$E(R_i) = \frac{Div_1}{P_0} + g$$

$$\hookrightarrow \frac{EPS_1 (1 - RR)}{P_0} + (ROE \times RR)$$

**Stock A:**

$\text{Theor}_A \quad E(R_A) = 4\% + 1{,}2(12{,}5 - 0{,}04)$

$= 14{,}2\%$

$\text{Real net}_A = \frac{6(1-0{,}4)}{30} + (12\% \times 40\%) = 16{,}8\%$

The price (30) is undervalued, it must be higher so we can have 14,2.

**Stock B:**

$\text{Theor}_B \quad E(R_B) = 4\% + 0{,}8[12{,}5 - 4\%]$

$= 10{,}8\%$

$\text{Real net}_B = \frac{4(1-0{,}4)}{60} + (12 \times 40\%) = 8{,}8\%$

Here the price of stock is overvalued

→ TO find the price, put the theor % and the price = P