Session 02

Cost of Capital

Programme : Postgraduate Diploma in Business, Finance & Strategy (PGDBFS 2017)

Course : Corporate Valuation (PGDBFS 203)

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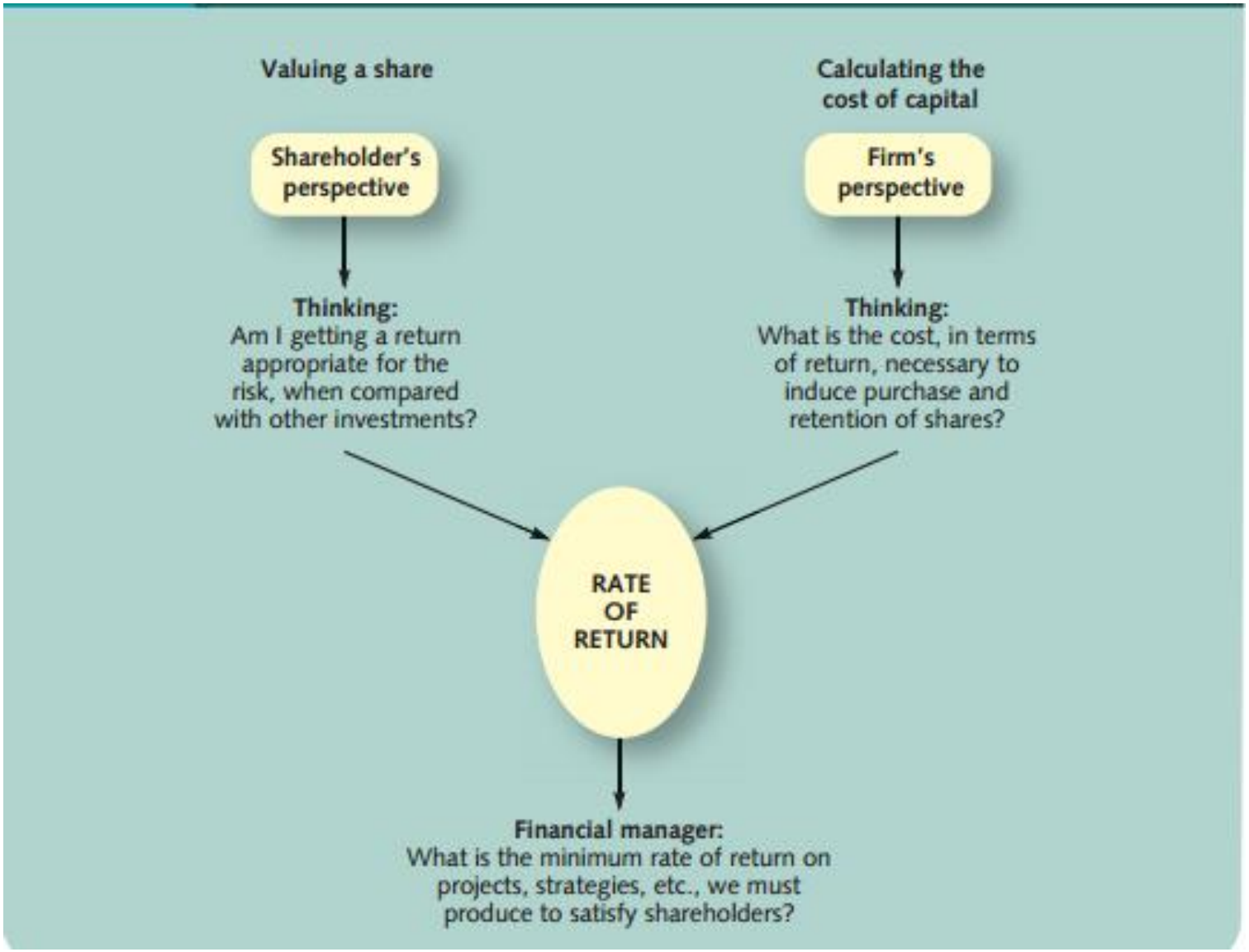
Lecture Outline

- Calculate and explain the cost of debt capital, both before and after tax
- considerations
- Describe the difficulties in estimating the equity cost of capital and explain the key elements that require informed judgement
- Calculate the weighted average cost of capital (WACC) for a company and explain the meaning of the number produced
- Explain the outstanding difficulties in this area of finance

Reference : Valuation : Measuring and Managing the Value of Companies, Tim Koller, Marc Goedhart and David Wessels : 06th Edition, Chapter 13

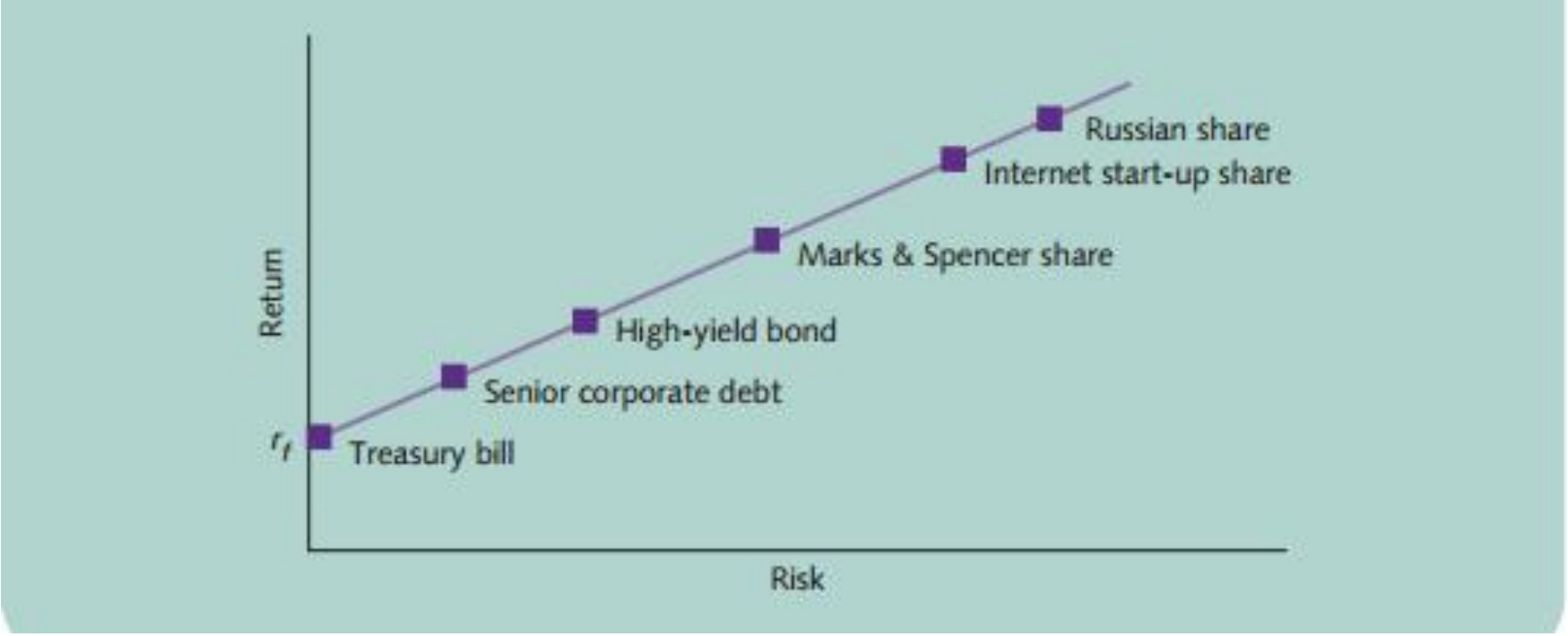
Two Sides of the Same Coin



Importance of Cost of Capital

- We know that the return earned on assets depends on the risk of those assets
- The return to an investor is the same as the cost to the company
- Our cost of capital provides us with an indication of how the market views the risk of our assets
- Knowing our cost of capital can also help us determine our required return for capital budgeting projects

Risk–Return – hypothetical example



Cost of Debt (Kd)

Cost of debt refers to the effective rate a company pays on its current debt.

The cost of debt is generally determined by the following factors:

- The prevailing interest rates.
- The risk of default (and expected rate of recovery of money lent in the event of default).
- The benefit derived from interest being tax deductible.

Irredeemable Debt *(Traded Debt)*

$$k_{\text{d net}} = \frac{i(1 - t)}{P_0}$$

$k_{\text{d net}}$ = cost of debt (after tax)
i = annual interest
t = rate of corporation tax (assumed immediately recoverable)
P_0 = market value of debt (ex-interest, i.e. immediately after payment).

Assume 7% debentures quoted at £90 (ex-int),interest just paid, and corporation tax is 30%,calculate the cost of debt:

Redeemable Debt *(Traded Debt)*

$$P_D = \sum_{t=1}^{t=n} \frac{i}{(1+k_D)^t} + \frac{R_n}{(1+k_D)^n}$$

where:

i = annual nominal interest (coupon payment) receivable from year 1 to year n;

R_n = amount payable upon redemption;

k_D = cost of debt capital (before the tax benefit).

$\sum_{t=1}^{t=n}$ means add up the results of all the $\frac{i}{(1+k_D)^t}$ from next year (year 1) to the t number of years of the bond's life.

Redeemable Debt

Elm plc issued £100m of bonds six years ago carrying an annual coupon rate of 8 per cent. They are due to be redeemed in four years for the nominal value of £100 each. The next coupon is payable in one year and the current market price of a bond is £93.

a. Calculate cost of debt before tax
b. if tax rate is 30%, calculate cost of debt

Calculate the cost of a 7% debenture currently quoted at £90.It will be redeemed at £101 in 5 year's time. Interest and redemption payments are assumed to be payable at yearend and tax of 30% to be immediately recoverable.

Untraded Debt

- Most debt capital, such as bank loans, is not traded and repriced regularly on a financial market.
- We need to find the rate of interest that is the opportunity cost of lenders' funds – the current 'going rate' of interest for the risk class.
- The easiest way to achieve this is to look at the rate being offered on similar tradable debt securities

Floating Rate Debt

- Interest payable is set at a margin over a benchmark rate such as bank base rate or LIBOR
- Practical purposes the current interest payable can be taken as the before-tax rate of return
- It may be that a firm rolls over a series of short-term loans and so in effect will be using this as long-term finance
- In this case the theoretically correct approach is to use the long-term interest rate and not the current short-term rate because the former more accurately reflects what is likely to be required to be paid over the life of the loan

Convertible Debt

A convertible debt of 5 years has a coupon rate of 6% and is currently trading at $105. The conversion ratio is 15 (15 shares for every $100 bond). The current share price is $5.40 and it is expected to increase by 10% p.a. Marginal tax rate is 30%

Calculate the cost of convertible debt

Cost of Preference Shares (Kp)

Preference shares have some characteristics in common with debt capital (e.g. a specified annual payout of higher ranking than ordinary share dividends) and some characteristics in common with equity (dividends may be missed in some circumstances, and the dividend is not tax deductible)

$$k_p = \frac{d_1}{P_p}$$

Kp : Cost of Preference Shares
D1 : Annual preference dividend
Pp : Price of Preference Shares

Note : Preferred dividends are not tax-deductible, so no tax adjustments necessary

Cost of Equity (Ke)

Investors in shares require a return equal to the risk-free rate (usually taken to be that on government securities). Secondly, there is the risk premium, which rises with the degree of systematic risk:

$$\text{Rate of return on shares} = \text{Risk-free rate} + \text{Risk premium}$$

$$k_E = r_f + RP$$

Capital Asset Pricing Model (CAPM)

$$k_E = r_f + \beta (r_m - r_f)$$

1. The risk-free rate, R_F
2. The market risk premium, $\overline{R}_M - R_F$
3. The company beta, $\beta_i = \dfrac{Cov(R_i, R_M)}{Var(R_M)} = \dfrac{\sigma_{i,M}}{\sigma_M^2}$

Does historic co-movement with the market index reflect future risk accurately?

General acceptance that it is only systematic risk that is compensated for in the required returns.

Gordon growth model

$$P = \frac{d_1}{k_E - g} \quad \Rightarrow \quad k_E = \frac{d_1}{P} + g$$

D1 : Dividend to be received next year
G : Growth Rate
P : Price of the security
Ke : Cost of Equity

g = ROE * Retention ratio

Retention Ratio= (1- payout ratio)

Problem in the practical employment of this model is obtaining a trustworthy estimate of the future growth rate of dividends to an infinite horizon

Model is very sensitive to the figure put in for g

Cost of Retained Earnings (Ks)

- There is a temptation to regard retained earnings as ‘costless’
- Retained earnings should be seen as belonging to the shareholders
- These funds therefore have an opportunity cost.
- Cost of retained earnings should equal to the expected returns required by shareholders buying new shares in a firm
- In practice new share issues involve costs of issuance (floating cost) and therefore are required to give a marginally higher return

Weighted Average Cost of Capital (WACC)

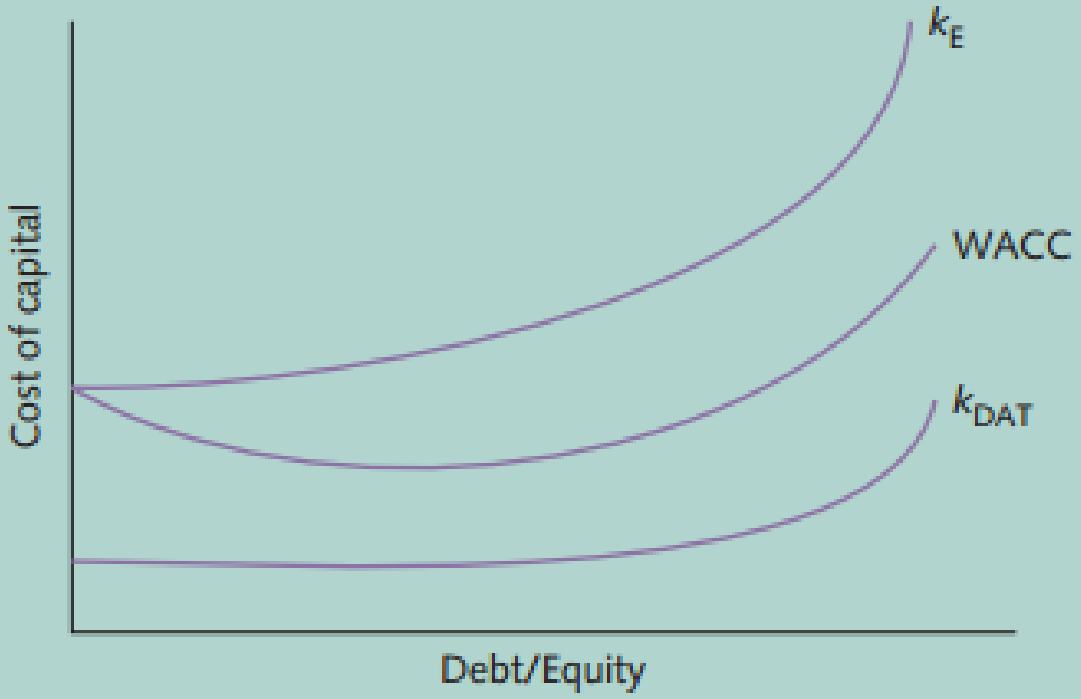
$$\text{WACC} = \frac{D}{D+E}k_d(1-T_m) + \frac{E}{D+E}k_e$$

Imagine that a corporation is to be established by obtaining one-half of its £1,000m of capital from lenders, who require an 8 per cent rate of return for an investment of this risk class, and one-half from shareholders, who require a 12 per cent rate of return for the risk they are accepting.

Calculate WACC

Weighted Average Cost of Capital (WACC)

Cost of capital with different capital structures (including consideration of the tax shield and finance distress)



Calculating the Weights

- **Book Value or Market Value**

- **Actual Vs Target Capital Structure**


ANY
QUESTIONS
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