COST OF CAPITAL (Brief overview)

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- **Cost of Capital** - The return the firm's investors could expect to earn if they invested in securities with comparable degrees of risk
- **Capital Structure** - The firm's mix of long term financing and equity financing
- The cost of capital represents the overall cost of financing to the firm
- The cost of capital is normally the relevant discount rate to use in analyzing an investment
- The overall cost of capital is a weighted average of the various sources:
    - WACC = Weighted Average Cost of Capital
    - WACC = After-tax cost x weights

Need

- Investment (capital budgeting) decisions – neither the NPV rule nor the IRR rule can be implemented without knowledge of the appropriate discount rate
- Financing decisions – the optimal/target capital structure minimizes the cost of capital
- Operating decisions – cost of capital is used by regulatory agencies in order to determine the "fair" return in some regulated industries (e.g. electric utilities)

Debt:

- The cost of debt to the firm is the effective yield to maturity (or interest rate) paid to its bondholders
- Since interest is tax deductible to the firm, the actual cost of debt is less than the yield to maturity:
    - After-tax cost of debt = yield x (1 - tax rate)
- The cost of debt should also be adjusted for flotation costs (associated with issuing new bonds)

	with stock	**with debt**
EBIT	**400,000**	**400,000**
- interest expense	**0**	**(50,000)**
EBT	**400,000**	**350,000**
- taxes (34%)	**(136,000)**	**(119,000)**
EAT	**264,000**	**231,000**

with stock	**with debt**
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EBT	**400,000**	**350,000**
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EAT	**264,000**	**231,000**
- dividends	**(50,000)**	**0**
Retained earnings	**214,000**	**231,000**

Debenture

- $Kd = \frac{\{\text{Interest}(1\text{-Tax Rate}) + (\text{Redeemable Value} - \text{Net Sale Proceeds})/N\}}{(\text{Redeemable Value} + \text{Net Sale Proceeds})/2}$

$$Kd = \frac{\{I\,(1-t) + (RV - SP)/N\}}{(RV + SP)/2}$$

Preference Share:

$$Kp = \frac{\{\text{Preference Dividend } (1+\text{Dividend Tax}) + (\text{Redeemable Value} - \text{Net Sale Proceeds})/N\}}{(\text{Redeemable Value} + \text{Net Sale Proceeds})/2}$$

$$Kp = \frac{\{Dp\ (1+Dt) + (RV - SP)/N\}}{(RV + SP)/2}$$

Retained Earnings:

- Why is there a cost for retained earnings?
- Earnings can be reinvested or paid out as dividends
- Investors could buy other securities, and earn a return.
- Thus, there is an *opportunity* cost if earnings are retained
- Common stock equity is available through retained earnings (R/E) or by issuing new common stock:
    - Common equity = R/E + New common stock

New Stock:

- The cost of new common stock is *higher* than the cost of retained earnings because of flotation costs
    - selling and distribution costs (such as sales commissions) for the new securities

WACC:

- WACC weights the cost of equity and the cost of debt by the percentage of each used in a firm's capital structure
- WACC=(E/ V) x KE + (D/ V) x KD x (1-TC)
    - (E/V)= Equity % of total value
    - (D/V)=Debt % of total value
    - (1-Tc)=After-tax % or reciprocal of corp tax rate Tc. The after-tax rate must be considered because interest on corporate debt is deductible
- WACC should be based on market rates and valuation, not on book values of debt or equity
- Book values may not reflect the current marketplace
- WACC will reflect what a firm needs to earn on a new investment. But the new investment should also reflect a risk level similar to the firm's Beta used to calculate the firm's RE.
- The WACC is not constant

It changes in accordance with the risk of the company and with the floatation costs of new capital

Optimal Capital Structure:

- The optimal (best) situation is associated with the minimum overall cost of capital:
    - Optimum capital structure means the lowest WACC
- Usually occurs with 30-50% debt in a firm's capital structure
- WACC is also referred to as the required rate of return or the discount rate