Chapter 9 : (The Cost of Capital)

تكلفة رأس المال

هل رأس المال اله تكلفة ؟ أكيد

كل المصادر يلي بستخدمها في جلب الربح تكلفة

represent the firms Cost of financing ⟨ debt / equity ⟩ and is the minimum rate of return → Firm عشان اجيب مصاري نجي

project ل الربح نبي للربح نجي

* Financial managers الحالة الاولى على مصدرين Sources of financing وهي مصادر عندي نوعين
: debt and equity

اما عشان اقدر to minimize the return لازم اعمل اني احسب

optimal mix of debt and equity financing

لازم تكون افضل خلطة مابين equity , debt

فلازم اخرى تكون افضل حالي من debt ومن اقول حالي من equity عشان تكون Cost

تبقى اقل ما يكن

ـــ

مثال : عندي شركة عندها 2 investment

Investment A
- Cost = $100,000
- Life = 20 years
- Expected Return = 7%
- least Costly financing Source available
- Debt (bonds) = 6%

Return ما اله ، return 1% بوخذ الا نحليا يعني *
cost في عليه بحصل في

Investment B
- Cost = $100,000
- life = 20 years
- Expected Return = 12%
- least Costly financing Source available
- Equity = 14%

يجي نحليا على 2% خسارة بتكلفني *
Earning يعني في الا

* عندي 2 projects بكلفوني نفس الثمن و useful life نفس التمن الثاني حتى
نفس الظروف ، اذا حيت اقارن بخص الظروف ، project A في اله Return 7%
Cost نفس عين بختار ؟؟

بختار B لان اله higher Return عين ، لو بدي اختار B هل بقدر to minimize cost
يعني ما قدر ا حتى ربح اكبر ؟؟

→

debt or equity ← optimal max نسبة أكبر تابت على فضل

نفترض ان نسبة debt 50% و equity 50%

$(0.50 * 6\% \text{ debt}) + (0.50 * 14\% \text{ equity}) = \underline{10\%}$ (weighted average cost)

Investment B حجوزم ↓

12% أكبر من 10%

```
external ┤ long term debt
         │ Preferred stock      } Sources of
         └ Common stock           financing
internal { Retained earnings
```
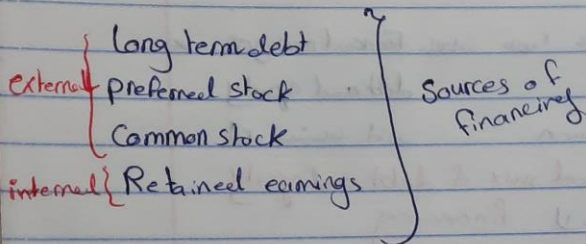
(Cost of debt) → financing cost 🔑

لا تحكي عن اي قرض أحسد سندات وبكي انوف نشو تكلفة هاي السندات لكي عندي
نتجي من خلال long term borrowing

تكلفة الدين cost provide دفع الدين

• Market price = 1100 total proceeds
○ Par value of bond = 1,000

○ IPO → initial public offering الاكتتاب
• Public offering اكتتاب

• Flatation cost : underwriting cost , administrative cost
  تكاليف الكتاب   تكاليف ادارية

انا لما ابدي اجي احمد سندات من لازم يكون بدي اوض موافقة من الهيئة المستقله الها تعيين
الصلاحية احمد سندات بيوه ردسوا ، ادع الحجم ، لكي ان عندي تراخيص معينة بدر لان اجي
اجي الكتب بدي موظف الاكتتاب ، system سجل ، درف ، مر

Net proceeds = total proceeds - Flotation Cost

Ex : Flotation Cost = $4
    Market price = 1100
        = 1100 - 4 = $\boxed{1.096}$

(Net proceeds)
                          security بيع خلال من الشركة تحصل التي Fund هي عبارة
    financial paper تصدر
are the funds actually received by the firm from the sale of a
security.

(Flotation Costs)
                          security بيع اصدار اكتتاب تكلفة قي
are the total costs of issuing and selling a security. They include 2
components.

1 - underwriting Costs - compensation earned by investment bankers for
    selling the security.

                     المال باع عشان عملتها اي تكلفة اي في selling علاقة قي
2 - Administrative Costs - issuer expenses such as legal, accounting,
    and printing

NP → flotation الفلوس هتحصل اللي الفلوس
        rate
        = 2%
NP = P(1 - F.R)
    1100(1 - 0.02) = 1,100 $\overset{*}{}$ 0.98 = 1,078

Yield to maturity = YTM = Cost of debt

(k_d) = YTM = $I + \dfrac{Par - MP\ NP}{n}$ 2) الديون تكلفة

             _____
                $\dfrac{Par + MP\ NP}{2}$

cost of
debt   • I = Coupon payment = C^{*} Par
       • MP = Market price
       • N = remaining years to maturity

Questions   End of years   Cash Flow   market price

يتم وقوعه   0 $960   960$ يتم شرائها بسعر

           1-20   - $ 90

           20   - $ 1000   par value تدفع في تاريخ معين

discount الذي يوجد عليها

لأن قيمة الاستثمار اعلى من حجم 1000

سيتم بيع وتم آخره في السنة الـ 20

                                           قبل الضريبة   befor

$$90 + \frac{1000 - 960}{20}$$ $\frac{90 + 2}{980} = \boxed{9.388 \%}$

$$\frac{960 + 1000}{2}$$

                After tax   بعد الضريبة

$$K_{d\ after\ tax} = K_d (1 - T)$$
$$0.09388 (1 - 0.4)$$
$$= 0.09388 (0.6) = 0.0563 = \boxed{5.63\%}$$

~~~~~~~~~~~~~~~~~~~~~~~~~

Cost of preferred stock
Pricing of preferred stock
- $P = \frac{D_o}{r}$
- Zero growth model

لأنه ليس لها تاريخ

- Cost of preferred stock
- Return = Cost

قصة تعريف $P = \frac{D_o}{r}$

- $P = \frac{D}{K_p}$ ∘ $K_p = \frac{D}{NP}$

$K_p = \frac{D}{P}$ ⇒

Ex: [Duchess Corporation is contemplating the issuance of a 10% preferred stock that they expect to sell for $87 per share. The cost of issuing and selling the stock is expected to be $5 per share.] The dividend is $8.70 ($10^ $87)

The net proceeds (Np) equal $82 ($87 - $5), the share price less the flotation costs. The cost of Duchess preferred stock is:

Dividends $= 0.1 * 87 = 8.70$

$Mp = 87$

flotation Cost $= 5$ $Np = Mp - F.c \rightarrow 87 - 5 = 82$

$Kp = \dfrac{D}{Np} = \dfrac{8.7}{82} = 0.106 = 10.6\%$

Cost of preferred stock

after tax   معدل الضريبة ↙

~~~~~~~~~~~~~~~~~~~~~~~~~~

Cost of Common Stock   يتم تجزيئه الى مصدرين

① مصدر مهم جدا   التكلفة من حالك من Common equity يشكل بشكل اكبر في مصدر الأسهم:

New issues of cs   ② او اخذ حالك من Retained earning = Retained earning

(current . "existing" C.s)

②

Price of common stock
• Constant growth model
• $P \times \dfrac{D_1}{r-g}$ $r - g = \dfrac{D_1}{P} + g$ $r = K_c = \dfrac{D_1}{P} + g$
                        $+g$

(لش استخدمنا P ما استخدمنا Np   (الذي ما عندي flotation cost
  عند new issues بس عندها
  reselling ما كلفتني اي شي)

Flotation Cost = 0
NP = Tp - F.C
NP = TP - O
NP = TP
NP = Market price

ex: Duchess Corporation wishes to determine is **Cost of Common stock**
equity , r_s . The market price , P_o of its common stock is
$50 per share. The firm expects to pay a dividends D_1 of $4 at the
end of the coming year , 2016 . The dividends paid on 6 year
the outstanding stock over the past 6 years (2010 - 2015) were as
follows

year	dividend
2015	$3.80
2014	$3.62
3013	$3.47
2012	$3.33
2011	$3.12
2010	$2.97

$$K = \frac{D_1}{P} + g \qquad = \frac{4}{50} + \boxed{0.05} \qquad = \boxed{13\%}$$

$$D_{2015} = D_{2010} (1+g)^n$$
$$3.80 = 2.97 (1+g)^5$$
$$\frac{3.80}{2.97} = \frac{2.97}{2.97} (1+g)^5$$

$$\sqrt[5]{1.28} = \sqrt[5]{(1+g)^5} \qquad \begin{matrix} 1.05 = 1+g \\ -1 \end{matrix}$$

$$\boxed{g = 5\%}$$

Capital asset pricing model (CAPM)

$$r = R_F + B(R_M - R_F)$$

$\underbrace{\qquad}_{RP}$

$$\boxed{K_c} r = R_F + B^* \boxed{RP}$$

↓ Risk premium

current بسعر

{ لتقييم استخدم CAPM لل current ؟
لانه طبق على الاسهم انتشرو هوا في السوت .
اقرب تحديث طبقة انارزنا في B . }

ex: RF = 7٪
      B = 1.5
      RM = 11٪

$$K_c = RF + B(R_M - RF)$$
$$7 + 1.5(4) = \boxed{13\%}$$

Cost of Retained Earnings

قصد طاما بحث لل current

ما باستخدم fund موجود عند طبق بالشركة (Internal source of financing)

$$r_f = r_s$$

تكلف بيع اسهم common stock كلفة Cost of a new issue of common stock
لانه بيكون لاول أمرا طرح بالسوات كشركة جديدة، بالكون في عند IPO
بيكون عند تكلفة underpricing سعر بيسبر below market Current markete
price

$$N_p = \underset{price}{market} - \underset{cost}{Flotation} \underset{\boxed{OR}}{} - \underset{+ overpricing}{underpricing}$$

$$r_n = \frac{D_i}{N_p} + g$$

$\longrightarrow$

Ex: Duchess Corporation common stock is currently selling at $50 $
per share. To determine its Cost of new common stock r_n. Duchess
Corporation has estimated that on average, new shares can be
Sold for $47. The $3 per shar underpricing is due to the
Competitive nature of the market. A second cost associated with
a new issue is flotation costs of $2.50 per share that would
be paid to issue and sell the new shares. The Total underpricing &
flotation costs per share are therefore $5.50.

$$NP = \text{total proceeds} - \text{flotation Cost} - \text{underpricing}$$
$$50 \quad - \quad 2.50 \quad - 3 \quad = 50 - 5.5 \quad = \boxed{44.5\$ = NP}$$

$$K_n = \frac{D_1}{NP} + g \qquad = \frac{4}{44.5} + 0.05 \qquad = 0.0898 + 0.05$$
$$\downarrow \qquad \qquad \qquad \qquad = 13.98\% \text{ or } \boxed{14\%}$$
احدثنا

SS Cost of Current C.S   في حال Cost of new   ليش
Issues

اذا في عند additional cost اذا بتشغل

~~~~~~

Weighted Avarage Cost of Capital (WACC)

_ Cost of debt k_d = 5.6 % after tax   كل طريقة إلها نوع
  " Prefeerd stock, r_p = 10.6 %.
  " " Retained earnings, r_r = 13%. Current Common stock
  " " new Common stock, r_n = 14%.

$\rightarrow$

The company uses the following weights in calculating its
weighted avarage cost of capital :-
- long term debt = 40%   * 5.6%   = 2.2% ⎫
- preferred stock = 10%   * 10.6%   = 1.1% ⎬ *
- common stock equity = 50% * 13%   = 6.5% ⎭

$$WACC = 9.8\%$$

~~~~~~

AL Jameel Center has determined its optimal capital structure
which is composed of the following souces

Source of capital	Target market proportions
long term debt	30%
preferred stock	5%
common stock equity	65%

Debt : Al jameel center can sell a 20-year, $1000 par value, 9%.
bond for $980. A flotation cost of 2% of the face value would
be required in addition to the discount of $20.

Preferred Stock : Al jameel Center has determined it can issue
preferred stock at $65 per share par value. The stock will pay an $8
annual dividend. The cost of issuing and selling the stock is $3 per share.

Common Stock : Al jameel center common stock is currently selling for
$40 per share. The dividend expected to be paid at the end of the
coming year is $5.07. it's dividend payments have been growing at
a constant rate for the last five years. Five years ago, the dividend
was $3.45. It is expected that to sell, a new common stock issue
must be underpricing at $1 per share and the firm must pay 1$
per share in flotation costs. Additionally, the firms marginal tax rate
is 40%.

Calculate Aljameel centers weighted averge cost of capital?

→ Solution

1 Cost of Debt

$$K_D = YTM = \frac{I + \frac{par - NP}{n}}{\frac{par + NP}{2}} = \frac{90 + \frac{1000 - 960}{20}}{\frac{1000 + 960}{2}}$$

$$= \boxed{9.38\%}$$

9% $I = C^* \, par$

$0.09^* 1000$

$= 90 \$$

* $NP = P(1 - FR)$

$= 1000(1 - 0.02)$

$= 980 \quad -20$

$= \boxed{960 \$}$

$$K_{D_{after \, tax}} = K_D (1 - 0.4)$$
$$= 0.0938^* 0.6$$
$$= 0.056 = \boxed{5.6\%}$$

2 Cost of preferred stock

$$K_P = \frac{D_o}{NP} = \frac{8}{65 - 3} = \frac{8}{62} = \boxed{12.9\%}$$

3 Cost of common stock

$MP = 40$

1 FC $NP = 40 - 1 - 1 = 38$

1 underpricing

$D_1 = 5.07$

5 years ago $D = 3.45$

$$K_e = \frac{D_1}{NP} + g$$

$$\frac{5.07}{38} + 0.08$$

$$= \boxed{21.3\%}$$

$$D_1 = D_o (1 + g)^n$$
$$5.07 = 3.45 (1 + g)^5$$
$$\sqrt[5]{1.469} = \sqrt[5]{(1 + g)^5}$$
$$\begin{array}{cc} 1.08 = 1 + g \\ -1 \quad -1 \end{array} \quad \boxed{g = 8\%}$$

$$WACC = W_d * K_{d_{after\ tax}} + W_p * K_p + W_c * K_c$$

$$(0.3 * 5.6) + (0.05 * 12.9) + (0.65 * 21.3)$$

$$1.68 + 0.645 + 13.845 = \boxed{16.17\%}$$