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FINN2

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Chapter 8 — Risk & Return — Thu 18 Jul

- Expected Return - Actual Return
- Beta
- Standard diviation

→ Risk

$ Return = Selling price − purchase price → $ Amount
$CF_1 - CF_0$

% R = (Selling − Purchase + yield → Div, Bond interest) / purchase price

Finn 2 — Sat. 20 Jul 2024

* Variance → في خطر بس ما بعرف درجته — Chapter 8, Second Part

Using Prob

Stocks	Return	Prob
A	٪10	٪30
	٪15	٪15
	٪30	٪55

To Calculate Average return * Avr = Σ r X Prob

(.1 X .3) + (.15 X .15) + (.3 X 55) = 0.2175 = Avr(A)

Standard division * Sd = √(r − Avr)² X Prob → Sd = √variance

1 * بنوجد Avr لل Stock بعدها بنطرح Avr من كل r على حدة (r − Avr)

2 * بنربع كل قيمة من (R − Avr)² X Prob

R	Avr	R − Avr	(R − Avr)²	(R − Avr)² X Prob
.1	.2175	−.1175	.01380625	.00414875
.15	.2175	−.0675	.00455625	.00068343 75
.3	.2175	.0825	.00680625	.00374343 75

Σ = Variance

Var = .0085756 25

→ Sd = √Variance → Sd = √.0085756 25 → .09260471 = Sd_A → Percent بنزبط النتيجة 9٪

Stocks	Return	Prob
B	٪5	30٪
	-3٪	15٪
	12٪	55٪

ما بتغير عشان أقدر أحاسب

Avr = (.05 X .3) + (−.03 X .15) + (.12 X .55)

Avr_B = .0765

R	Avr	R − Avr	(R − Avr)²	(R − Avr)² X Prob
.05	.0765	−.0265	.0007225	.00021675
−.03	.0765	−.1065	.01134225	.00147 13375
.12	.0765	.0435	.00189225	.00104 7375

+

Var = .00296546 25

Sd = √var → Sd = √.00826478 75 → Sd_B = .05433921 2

(1)

Sd (A) = .092567543
= 9%

Sd (B) = .054339212
= 5%

which one is more risky? Stock A is more risky.

* Coefficient of variation = $\frac{Sd}{AVr}$

مهم لقياس trade of between risk & return [اقديش ماخذة return مقابل ال risk

_ Cofficient of variation (بناءً على) > 1 → good. because risk less than return.

Risk prefferance :-

هو يلي بيوجهك لأي استثمار بدك تروح.

1. Risk Averse

* يطلب مقابل للـ risk يلي بيتعرض إلها.
يبي Return تغطي ال Risk يلي اخذتا
. The higher the risk → higher return

2. Risk Neutral

* ما بتطلع على ال Risk بس بتطلع
على ال Return (أعلى Return)
بغض النظر عن ال Risk.

3. Risk seeking (Lovers. Gamplers)

* بتطلع على أعلى Risk
مهتم بال Risk أكثر
من ال Return مثل المقامرين.

Risk single asset :-
1. Sd
2. Beta
3. Unexpected return _ actual return
4. The range

Range = Subtracting (طرح) ophimistic return - Pessimishing return (أعلى نسبة - أقل نسبة لل Return)

"you can't calculate the risk without Return."

Covariance & Correlation

- Statistical measure of the relation between 2 Assets.
- both measure the relation ship between 2 Assets.

* Covariance : the type of the relation., if the relation is pos or neg.
* Correlation : measure the strength of the relation.

"I Can't Calculate the Correlation without the Covariance"

* Covariance $= \frac{\sum (r - avr(\text{Asset A})) \times (r - avr \text{ Asset(B)})}{(n-1)}$, without Prob

* Covariance $= \sum (r - avr \text{ Asset(A)}) \times (r - avr \text{ Asset B}) \times \text{Prob}$ with Prob

Covariance $= \sum (r - avr_{(A)} \times r - avr_{(B)} \times \text{Prob})$ → There is prob

$= (-.1175 \times -.0265 \times .3) + (-.0675 \times -.1065 \times .45) + (.0825 \times .0432 \times .55)$

$= .0009934125 + .0010783125 + .0019602$

Covariance $= .0039726375$ positive relation ship.

* Correlation $= \frac{\text{Covariance}}{Sd_A \times Sd_B}$

Correlation $= \frac{.0039726375}{.09260467 \times .05433921} = .7894646867$ pos Strong relation

- Correlation $> .5$ → Strong relation.
- Correlation $< .5$ → weak relation.

Correlation: -1 perfect neg correlation | no relation: 0 | 1 perfect pos correlation

[A ↑ 40%] → [B ↓ 40%]

[A ↑ 40%] → [B ↑ 40%]

Mon 22 Jul 24

A	B
R	
10%	15%
17%	-3%
22%	9%

AVr sd Var Correlation CoV

$AVr = \frac{.1 + .17 + .22}{3} = .1633$

$AVr_B =$ $Var_B = .00615$

$Sd_B = 9.03\%$

$R - \bar{R}$	$(R - \bar{R})^2$
.1 − .1633	.003969
.17 − .1633	.0000489
.22 − .1633	.00321489

$Var = \frac{.007219}{2} = .003695$

$sd = \sqrt{.003695} = .060079$

- $CoV = -.00231$ → negative relation.
- Correlation = −.526 → semi weak (semi weak / semi strong)

W	
A	60%
B	40%

$\sqrt{.00134 + .0013 + -.0034} = 3.6\%$

Standard Diviasion : δ

Variance $= \delta^2$

Who to Calculate Risk, Return 2 Asset Portfolio ?

Weight always = 100%

* $R_p = (W_a \times \bar{R}_a) + (W_b \times \bar{R}_b) + \ldots\ldots (W_n \times \bar{R}_n)$

$SD = \sqrt{W_a^2 \times \sigma_a^2 + W_b^2 \times \sigma_b^2 + 2 W_a W_b \times COV}$

COV → Correlation × Sd_a × Sd_b

Tue 23 Jul 2024

- Beta — حساسية السهم للسوق
- Security Marketable
- total risk = Systimatic + Onsystimatic
  - Systimatic: Market, undiversifial, non Controlable
  - Onsystimatic: diversiable, controlable, Unique (firm risk)

CAPM

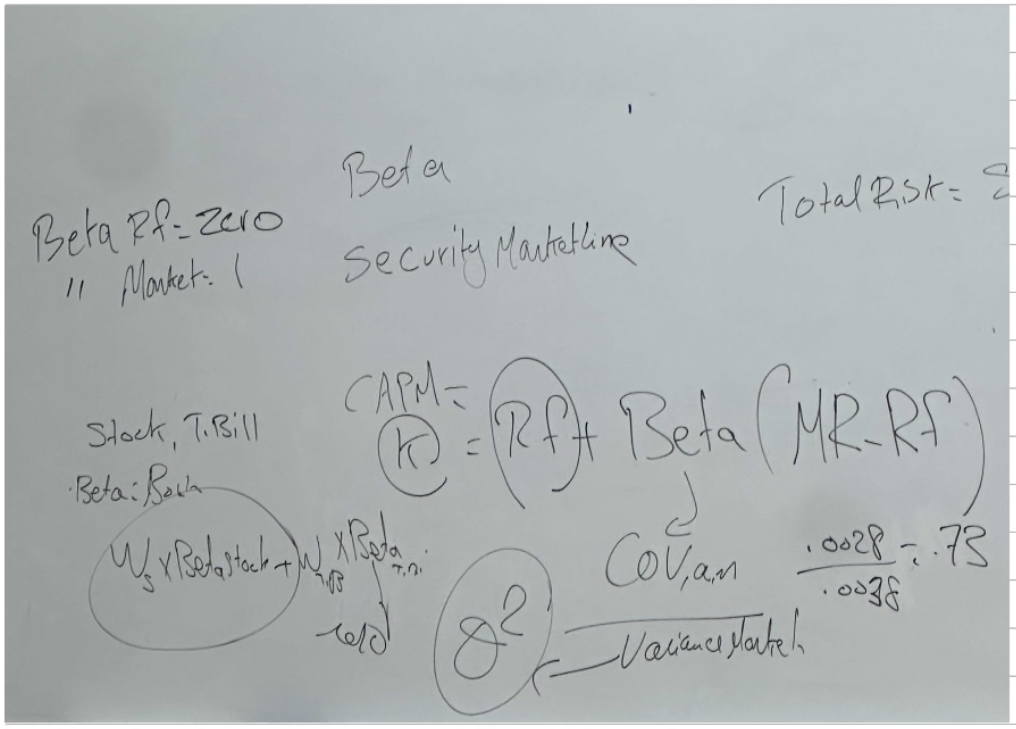
$$K = RF + Beta\,(MR - MF)$$

Premium

$$Beta = \frac{Cov}{\sigma^2\ variance\ market}$$

علاقة السهم مع السوق

- Beta RF = Zero
- Beta Market = 1



هذا السهم Beta تبعه أكثر من 1 يكون التذبذب عنده عالي ← Risk عالي

Beta ∝ Risk

Market Return : return

* $Beta_p = w_a \times Beta_a + w_b \times Beta_b$

Q:

Prob	R A	R B
55%	5%	22%
15%	12%	-7%
30%	4%	30%

$AvR_A = .55 \times .05 + .15 \times .12 + .3 \times .04 = .0575 = \bar{R}_A$

$(R-\bar{R})^2_a$	$(R-\bar{R})^2 \cdot Prob_a$	$(R-\bar{R})^2_B$	$(R-\bar{R})^2 \cdot Prob_B$
.00006	.00003	.0004	.00022
.00391	.00059	.0729	.01094
.00031	.00009	.01	.003

$Variance_A = .00074$

(standard dev) $\sigma = \sqrt{.00074} \rightarrow \sigma = 2.66\%$

$\sigma^2_B = .01416$

$\sigma_B = 11.9\%$

$AvR_B = 20\%$

$Cov = \Sigma R - \bar{R}_A \times R - \bar{R}_B \times Prob$

$= .00008 + -.00253 + -.00053$

$Cov = .00298$

$Correlation = \frac{Cov}{SD_a \times SD_b} = \frac{.00298}{20\% \times 11.9\%} = .96$

$RP = w_a \times \bar{R}_a + w_b \bar{R}_b$ return portfolio

$= .7 \times .0575 + .3 \times 2 = 10.25\%$

$\sigma^2 = w_a^2 \sigma_a^2 + w_b^2 \sigma_b^2 + 2 w_a w_b Cov$

$\sigma^2 = .0003$

$\sigma = 1.8\%$

$$CV = \frac{\sigma}{\Sigma R} = \frac{2.68\%}{5.57}$$

$$\begin{aligned} COV \quad m.a &= -.005 \\ m\ b &= -.003 \end{aligned}$$

$$\sigma m = 4\%$$

$$Beta_A = \frac{COV}{\sigma^2 m} = \frac{-.005}{.0496} = -.255$$

$$Beta_B = -.0453$$

$$Beta_P = W_A \times B_{eta_A} + W_B \times Beta_B$$

$$Beta_{Port} = .7 \times (-.255) + .3\,(-.0453)$$

Bond valuation

- Price Bond
- Current yield
- yield to Maturity
- yield to Call

Time Value of money (TMV)

PV (÷) ——— FV (X)

PV:

- Annuity: $PMT \times \dfrac{\left(1 - \frac{1}{(1+i)^n}\right)}{i}$
- Single amount: $\dfrac{FV}{(1+i)^n}$
- Perpetuity (forever): $\dfrac{FV \text{ (Payment)}}{i}$
- Mix stream: $\dfrac{FV}{(1+i)^1} + \dfrac{FV}{(1+i)^2} + \dots + \dfrac{FV^n}{(1+i)^n}$

Stated Interest (yield to maturity)

- Price of the Bond $= PMT \times \dfrac{\left(1 - \frac{1}{(1+i)^n}\right)}{i} + \dfrac{1000}{(1+i)^n}$

PMT = Coupon Rate × Face Value

الا اذا بالسؤال اعطانا ياها غير

- face Value always = 1000
- Maturity = 15

- yield to Maturity < coupon rate → Bond Premium → Price > 1000
- YTM > coupon rate → Bond discount → Price < 1000
- YTM = coupon rate → face value → = 1000

$$\dfrac{50 \times \left(1 - \frac{1}{(1+.07)^{15}}\right)}{.07} + \dfrac{1000}{(1+.07)^{15}}$$

$455.4 + 362.45 = \boxed{817.85}$ → لازم يطلع أقل من 1000

n هي الوحيدة يلي بتضرب بالفترة → Quarterly for ex → n × 4
PMT, i بتنقسم عادي.

Ex : face value 1000
Maturity after (n) 30 years

Interest (coupon rate) 10%
Market (i) yiled to Mat 8%
semi annualy → $\frac{PMT}{2}, \frac{i}{2}, n \times 2$

* Bound Price?

- Price of the Bond $= \frac{PMT \times \left(1 - \frac{1}{(1+i)^n}\right)}{i} + \frac{1000}{(1+i)^n}$

PMT = Copoun Rate × Pale Value
= 10% × 1000 = 100

Price of the Bond $= \frac{\left(\frac{100}{2}\right) \times 1 - \frac{1}{\left(1+\frac{.08}{2}\right)^{60}}}{\frac{.08}{2}} + \frac{1000}{(1+.04)^{60}}$

$= \frac{50 \times (.905)}{.04} + \frac{1000}{10.52}$

= 1226.23 Premium because it's more than 1000

When YTM [<] Coupon rate → Bond Premium → Price [>] 1000

$$YTM = \frac{\text{Coupon Payment} + \frac{(\text{Face value} - MV)}{\#\text{ of Maturity}}}{\left(\frac{(\text{Face} + MV)}{2}\right)}$$

Ex: Price 900 $
Maturity 10 years
Coupon 7%

$$= \frac{70 + \frac{1000-900}{10}}{\frac{1000}{2}} = \frac{80}{950} = 8.4\% \rightarrow$$

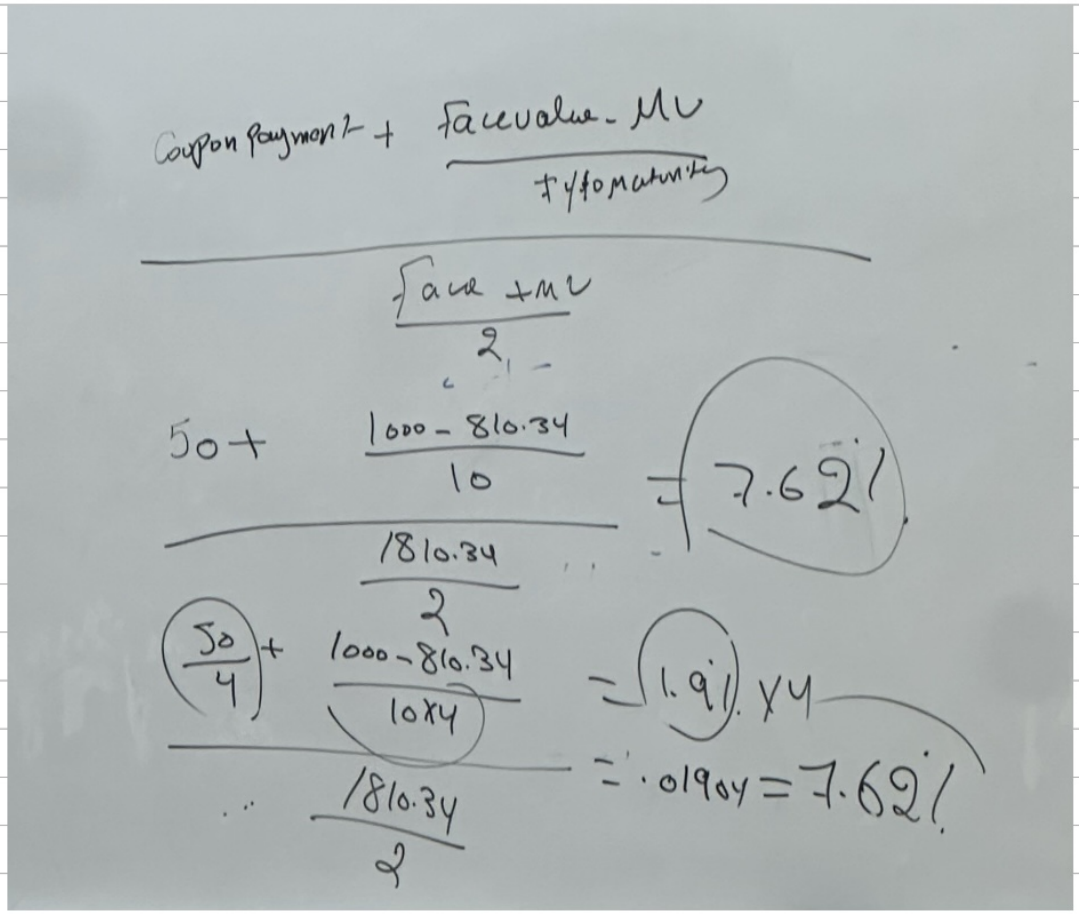
$\frac{PMT}{2}$, $\frac{\#\text{ of Maturity}}{2}$ → ... → $\frac{\text{...}}{2}$ semi ...

$$\text{Current Yield} = \frac{\text{Coupon Payment}}{\text{bond Price}}$$

Tue, 20 Jul

6-11

outline



6.2%.

Outline 6-15

100 par Value
Coupon rate 8%
interest annualy
i, y = 12 year
YTM = 4%

حكى في كمان ماركت اشيا بتبيع وبتشتري

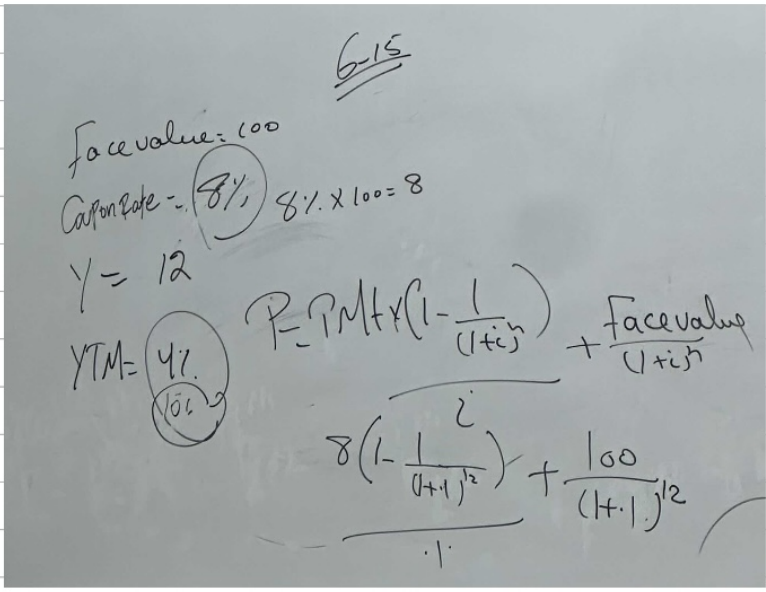
parvalue : Face Value

par Value x Couponrate = 100 x .08 = 8

$$P = PMT \times \frac{\left(1 - \frac{1}{(1+i)^n}\right)}{i} + \frac{1000}{(1+i)^n}$$

= 137.54 → premeium because > YTM

C. YTM = 10%



Chapter 7 Thu 1 Aug

Stock Valuation

- Debt → Bond

Borrower creditor relationship has a time when the Debt end the relationship between them end

- There is Maturity
- Interest

ما بتعمل ربح وخسارة الشركة

- Equity
- No Maturity
- Dividened

Preferred stock, common stock
no voting right voting right

بتعمل ربح وخسارة الشركة

Equity Risker than Debt

اذا الشركة افلست أنا بفلس

اذا في تداين ما وقتها بتحجز على أملاكه بما بفتس

Authorized Shares :
Issued → Sold to Shareholder

- outstanding could be = Issued → if there is no Treasury stocks
- outstanding = Issued - Treasury stocks

Typs of Shares:

- Voting Shares → Common Stock
- Sober share → مشتري السهم بأرخص
- non-voting → Preferred

Common Stocks

- ADR: American deposit recited → مثلاً توريوتا يابانية بتبع بأمريكا.
  listed in America
- GDR: Global
  2.5 stock
  بتبع كتلان غير أمريكا.
- CDR: Chaina

Par Value → Par value الي راح الاسهم

* When you split # of stocks increase
  price of stocks decreases

Preemtive right → طالبقدر الشركة تعبي بالاسهم يلي أنا مستثمرة فيها على مزاجها (نسبة الأسهم يلي أنا مستثمرة فيها ما بتتغير لحد ما أنا أقرر اذا الشركة بدها ترفع نسبة أسهمها)

Preferred Stocks (hipyred financ asset)

Convertabile Feature ← Bond من هجينة ① مزايا

Commons عادي أسهم ②

PS

required rate of return

zero growth dividend

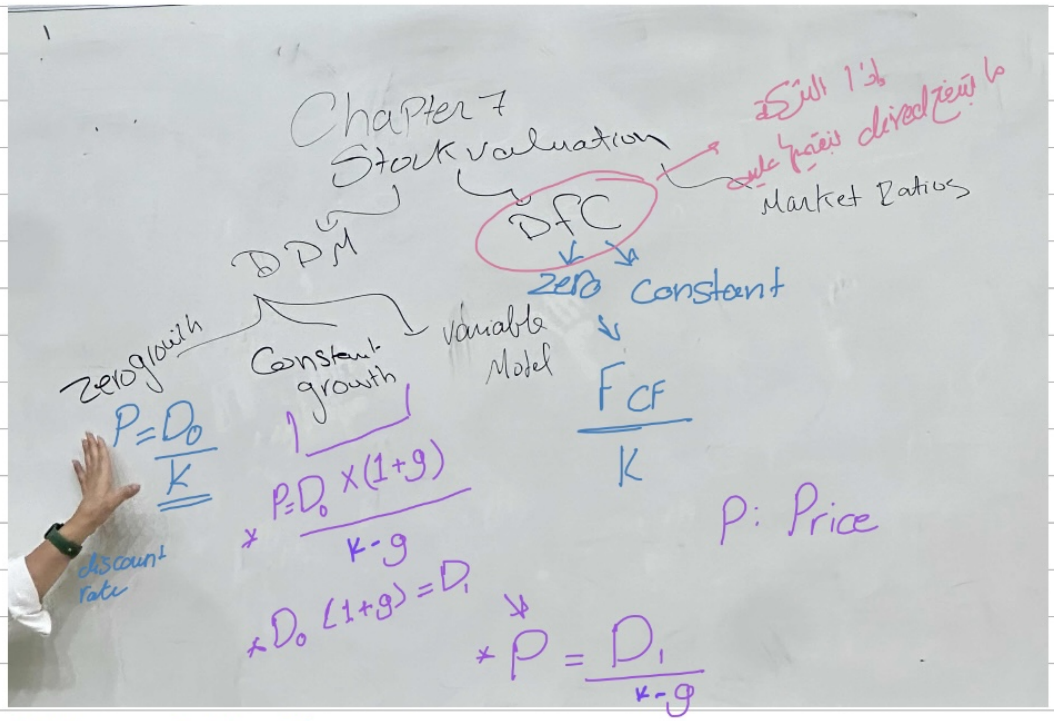
$P = \frac{D}{K}$ zero growth modle

$K \leq R_F \rightarrow B$ (Pfemium)

Perpetuity → يدفع فلوسك على discount الأبد rate

Valuation C.S

Tue. 6 Aug



prefferet Stock → perpebity ??

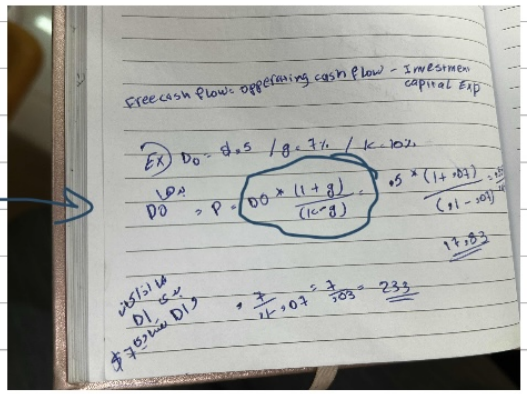
Free Cash Flow = operating cash flow — Investment Capital Exp

g : growth

- The higher the growth → the higher the price
- The higher the discount rate the Lower the Price

$D_0 = 3\$$
$g = 5\%$
$K = 12\%$

$$P = \frac{3 \times (1.05)}{.12 - .05} = 45$$

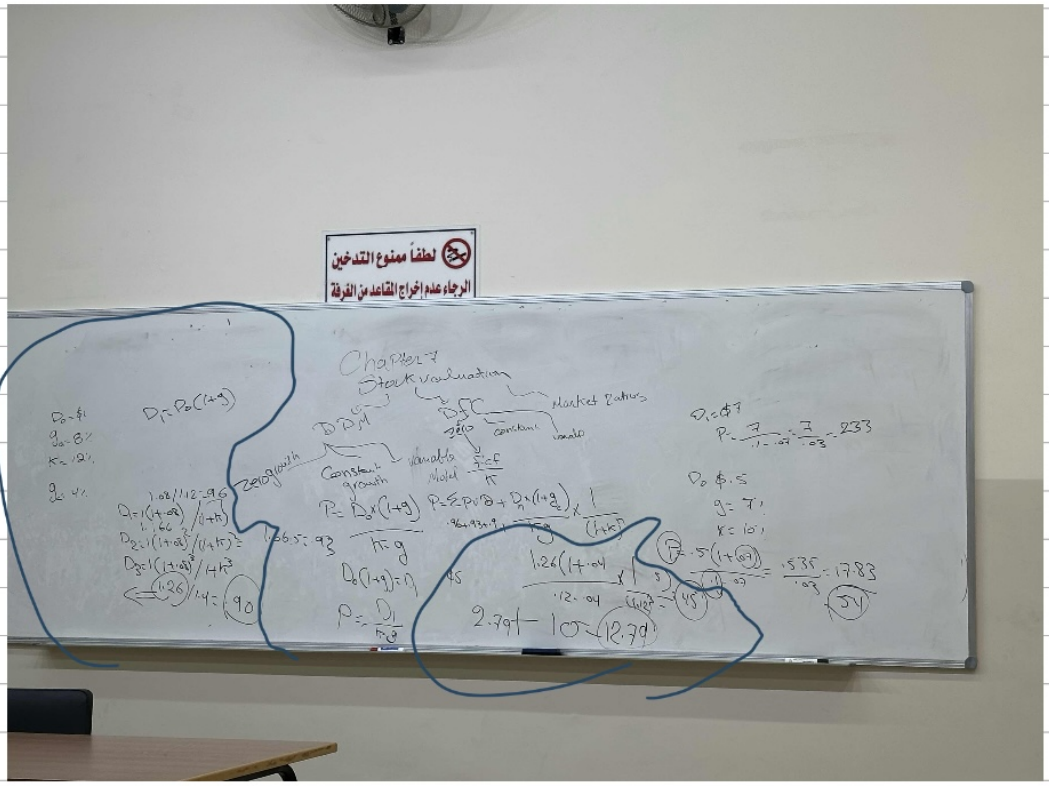


$P = \sum PVD + \frac{D_n \times (1+g)}{K-g} \times \frac{1}{(1+K)^n}$ → 2 growth لما يكون عندنا

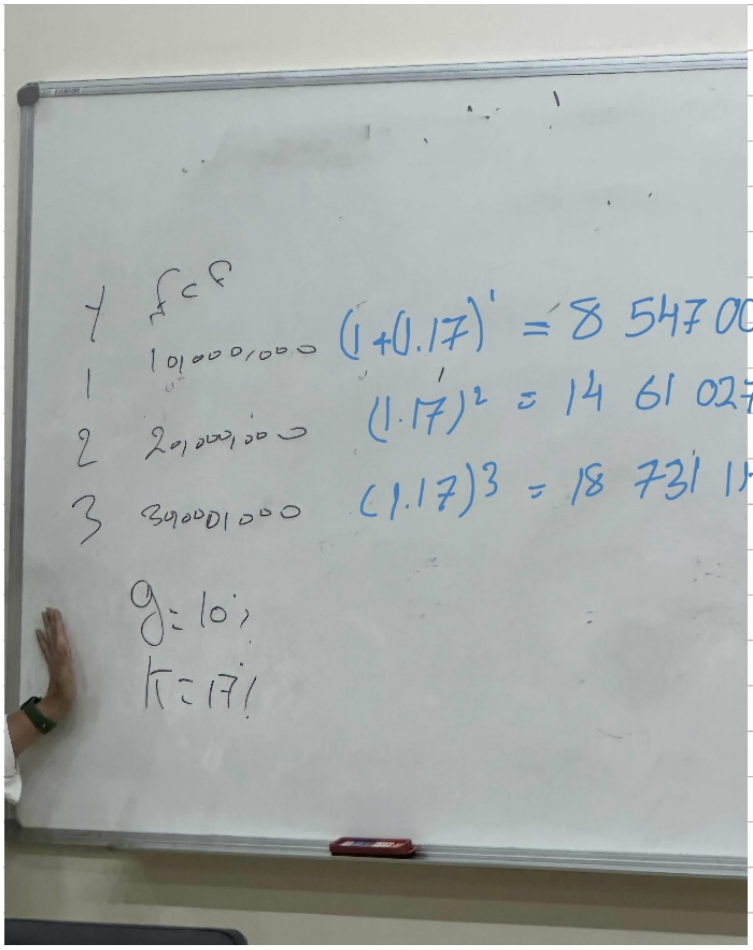
آخر توزيعة

D_n : Dividend آخر

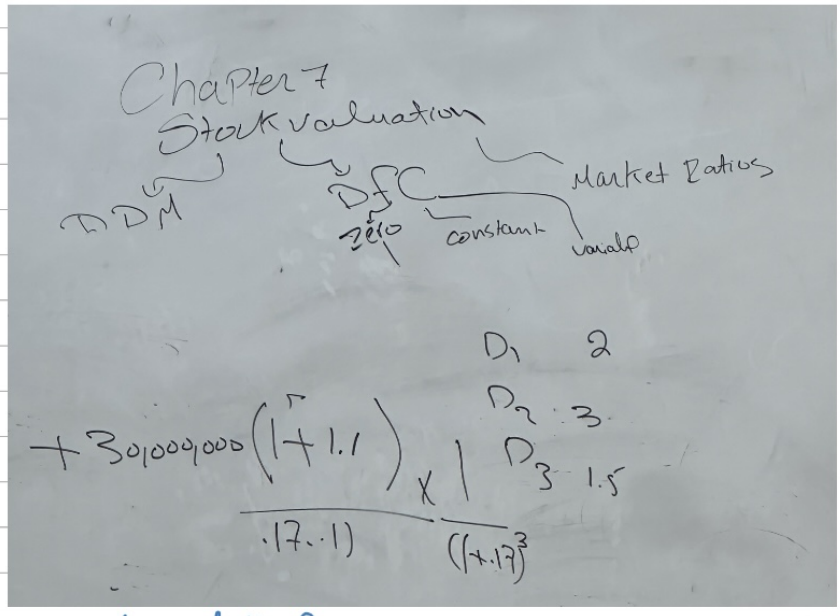
future value



find free cash flow?



step ① → Σ



Final result = 336 237 504 → value of the firm

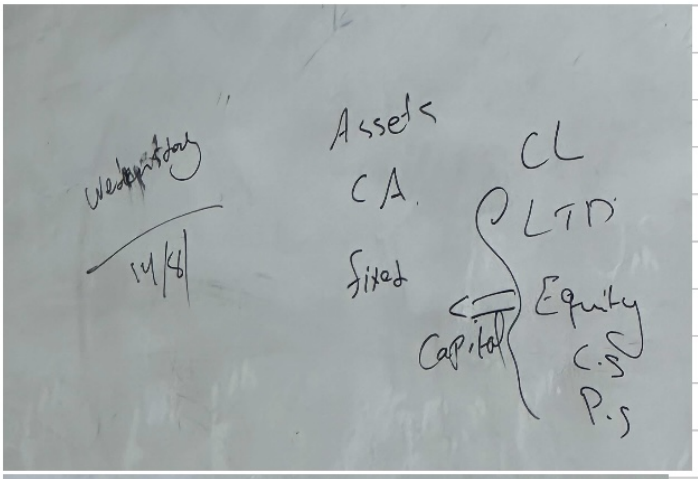
* طالبنا توزيع الـ stock على عدد الـ Stocks

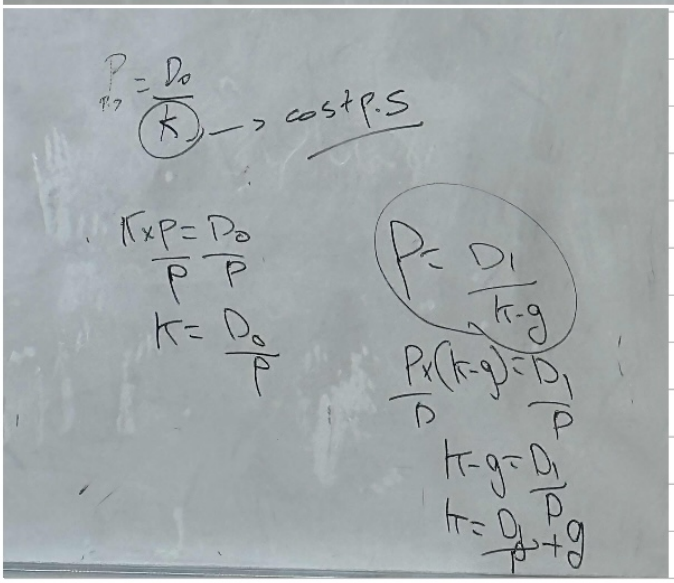
* لذا بدنا نوزع الـ Common Stock

C.S = Value of the firm - MV of the Bond - MV of P.S

Chapter 9
Cost of Capital

12 Aug 2024





Bond → YTM $= \dfrac{PMT + \left(\dfrac{\text{face value} - MV}{\text{\# of Maturites}}\right)}{\left(\dfrac{\text{face value} + MV}{2}\right)}$

- replace MV with net proceeds

* Net proceeds = MV − flotation Amount
* flotation amount = flotation cost × face value

after finding net proceed

$$YTM = \frac{PMT + \left(\frac{\text{Face Value} - NP}{\text{of Maturites}}\right)}{\left(\frac{(\text{Face Value} + NP)}{2}\right)} \times (1 - tax)$$

NP: Net proceeds.

اذا بيعطونا ياها ٪ بنحولها لـ $

• Cost P.S $= K = \frac{D_0}{P} \rightarrow \left(K = \frac{D_0}{NP}\right)$

NP : المبلغ يلي الشركة قبضته مش يلي أعلنت عنه

↓

Came from → 1. Flotation
2. Under Valuation

over Valuation → replace the (−) with (+)

Cost of C.S

1. $\frac{D_1}{NP} + g$

2. $K = RF + \text{Beta}\,(\text{Bremium})$
$= RF + B\,(MR - RF)$

* Interial (اصدرت أسهمها لحالها بدون ماتستعين بطرف تاني ، داخلي)
There is no NP
There is Price

Cost of R.E $= \frac{D_1}{P} + g$

Ex: face value 1000 $
Copon rate 5 %. → PMT = 50
Price (Primium) 1200 $
flotation Cost 3%
Maturity 30
Tax rate 40%
Interest Semi annually → $\frac{50}{2}$ → 125 = PMT
↓
YTM? Y Maturity = 30 X 2

* Net proceeds = NV - flotation Amount
* flotation amount = flotation Cost X face Value

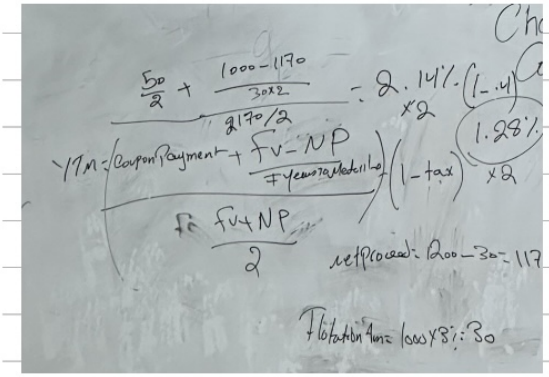
flotation Cost = 3% X 1000 = 30
Net proceeds = 1200 - 30 = 1170

$$YTM = \frac{PMT + \left(\frac{\text{face value} - NP}{\text{\# of Maturites}}\right)}{\left(\frac{\text{face value} + NP}{2}\right)} \times (1 - tax)$$

$$= \frac{25 + \left(\frac{1000 - 1170}{60}\right)}{\left(\frac{1000 + 1170}{2}\right)} \times (1 - .4)$$

$$\frac{25 + (-2.8)}{(1085)} \times .6 = 1.23\%$$

↓
Semi annual بدي بجزيء بـ 2 لانو



→ حل الكتوبة السؤال

Preferred stock d = 5%
par value 100$
undervalued by 5$ for par
flotation cost 2%
what is price of P.S

$K_{Ps} = \frac{D}{P} \rightarrow \frac{5}{93} = 5.38\%$

$100 - 5 = 95$

$NP = 100 - 5 - 2 = 93$

Common stock Price = 10$ flotation 2$ NP = 10 - 2 = 8

$C.S = \frac{D_1}{NP} + g$

ممكن تيجي مجهولة بالامتحان بتحاسب على اجاها

$= \frac{3}{8} + 29.41\%$

$= 67\%$ Cost of Common stock

1	D_1	3
	D_2	5
2	D_3	2
3	D_4	6.5

$g = \left(\frac{6.5}{3}\right)^{\frac{1}{3}} = 29.41\%$

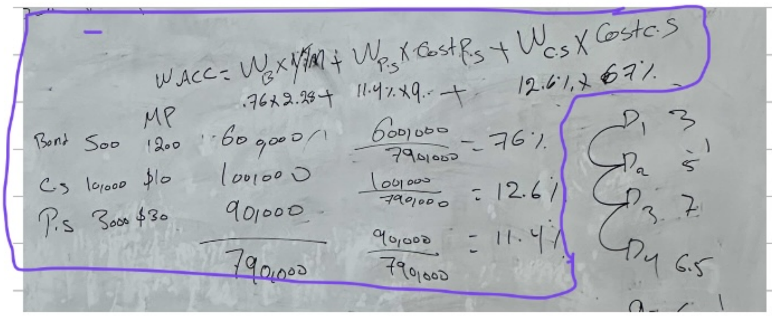
if its interial → NP = Price without flotation

$10 + 29.41\%$

Wighted Avarage Cost of Capital

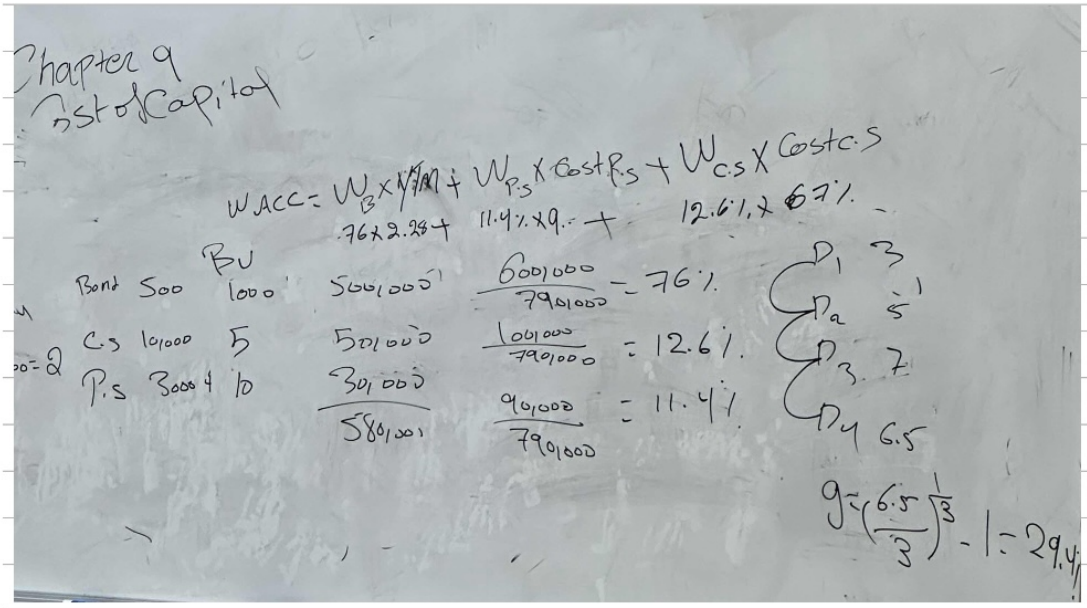
- $WACC = (W_{bond} \times YTM) + (W_{Ps} \times Cost\ Ps) + (W_{Cs} \times Cost\ Cs)$

Two ways to find wight [1] MV way



21 Book Value

نسبته بالطريقة اللي بيطلبها منا بالامتحان

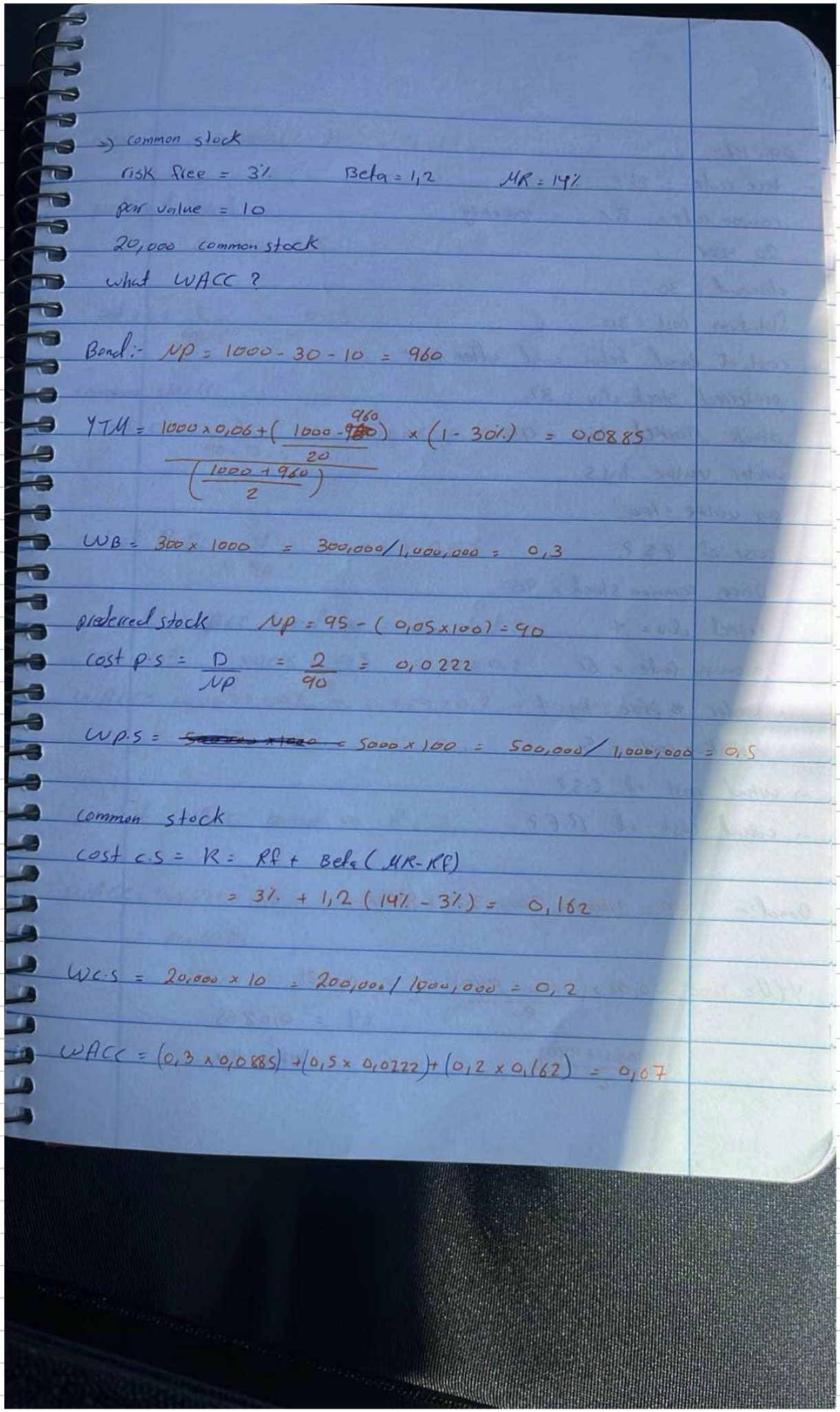


11 Aug 2024

Bond Coupon rate = 12 %
Semi annually
Maturity 10 years
discount 30 $
flotation cost 10 $
tax rate 30 % 300 Bond
Cost Bond ?

P.S	C.S
D 2$	RF = 3%
Value 95$	B = 1.2
Flotation cost 5%.	MR = 14 %
Par Value 100 $	Par value = 10 $
# of Stocks = 5 000	# of Stocks = 20 000

find wighted AVarage Cost of Capital



→ common stock

risk free = 3% Beta = 1,2 MR = 14%

par value = 10

20,000 common stock

what WACC ?

Bond:- NP = 1000 - 30 - 10 = 960

$$YTM = \frac{1000 \times 0,06 + \left(\frac{1000 - 960}{20}\right)}{\left(\frac{1000 + 960}{2}\right)} \times (1 - 30\%) = 0,0885$$

WB = 300 x 1000 = 300,000 / 1,000,000 = 0,3

preferred stock NP = 95 - (0,05 x 100) = 90

cost p.s = D / NP = 2 / 90 = 0,0222

W p.s = 5000 x 100 = 500,000 / 1,000,000 = 0,5

common stock

cost c.s = R = Rf + Beta (MR - Rf)

= 3% + 1,2 (14% - 3%) = 0,162

Wc.s = 20,000 x 10 = 200,000 / 1000,000 = 0,2

WACC = (0,3 x 0,0885) + (0,5 x 0,0222) + (0,2 x 0,162) = 0,07

P9-19

LG 3 LG 4 LG 5 LG 6 **P9–19 Calculation of individual costs and WACC** Lang Enterprises is interested in measuring its overall cost of capital. Current investigation has gathered the following data. The firm is in the 40% tax bracket.

Debt The firm can raise debt by selling $1,000-par-value, 8% coupon interest rate, 20-year bonds on which quarter *interest* payments will be made. To sell the issue, an average discount of $30 per bond would have to be given. The firm also must pay flotation costs of $30 per bond.

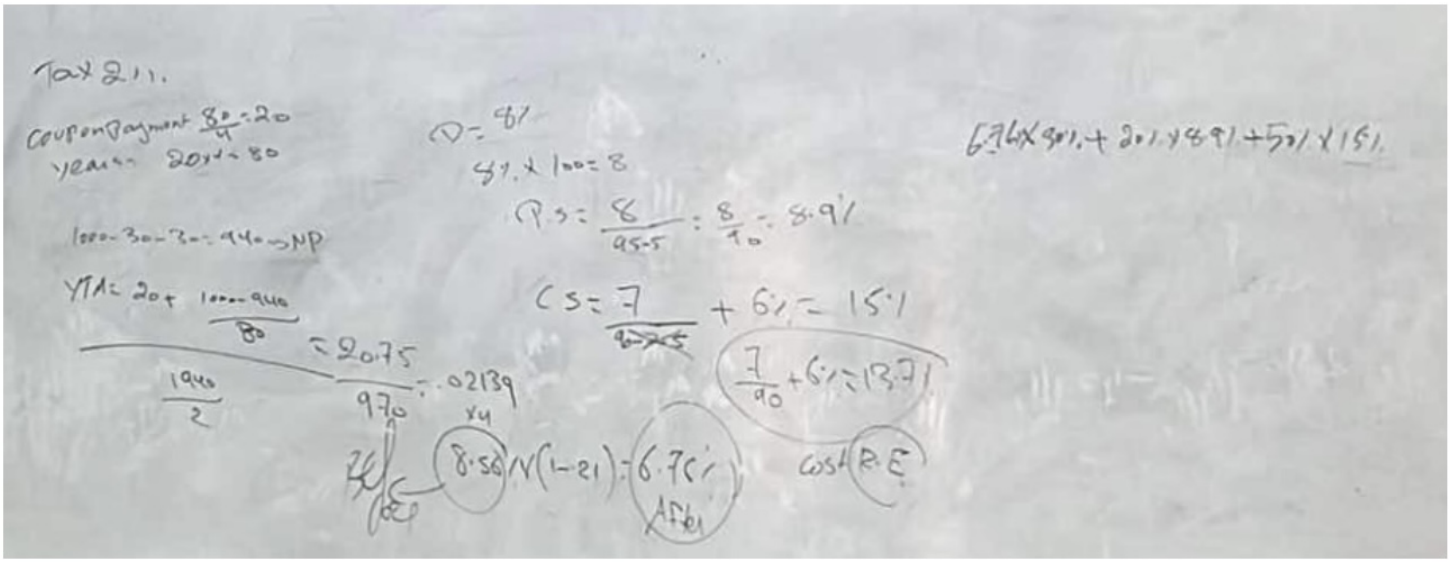
Preferred stock The firm can sell 8% preferred stock at its $95-per-share par value. The cost of issuing and selling the preferred stock is expected to be $5 per share. Preferred stock can be sold under these terms.

Common stock The firm's common stock is currently selling for $90 per share. The firm expects to pay cash dividends of $7 per share next year. The firm's dividends have been growing at an annual rate of 6%, and this growth is expected to continue into the future. The stock must be underpriced by $7 per share, and flotation costs are expected to amount to $5 per share. The firm can sell new common stock under these terms.

Retained earnings When measuring this cost, the firm does not concern itself with the tax bracket or brokerage fees of owners. It expects to have available

$100,000 of retained earnings in the coming year; once these retained earnings are exhausted, the firm will use new common stock as the form of common stock equity financing.

a. Calculate the after-tax cost of debt.
b. Calculate the cost of preferred stock.
c. Calculate the cost of common stock.
d. Calculate the firm's weighted average cost of capital using the capital structure weights shown in the following table. (Round answer to the nearest 0.1%.)



Source of capital	Weight
Long-term debt	35%
Preferred stock	12
Common stock equity	53

The tax rate of the firm is currently 40%. The needed financial information and data are as follows:

Debt Nova can raise debt by selling $1,000-par-value, 6.5% coupon interest rate, 10-year bonds on which *annual interest payments* will be made. To sell the issue, an average discount of $20 per bond needs to be given. There is an associated flotation cost of 2% of par value.

Preferred stock Preferred stock can be sold under the following terms: The security has a par value of $100 per share, the annual dividend rate is 6% of the par value, and the flotation cost is expected to be $4 per share. The preferred stock is expected to sell for $102 before cost considerations.

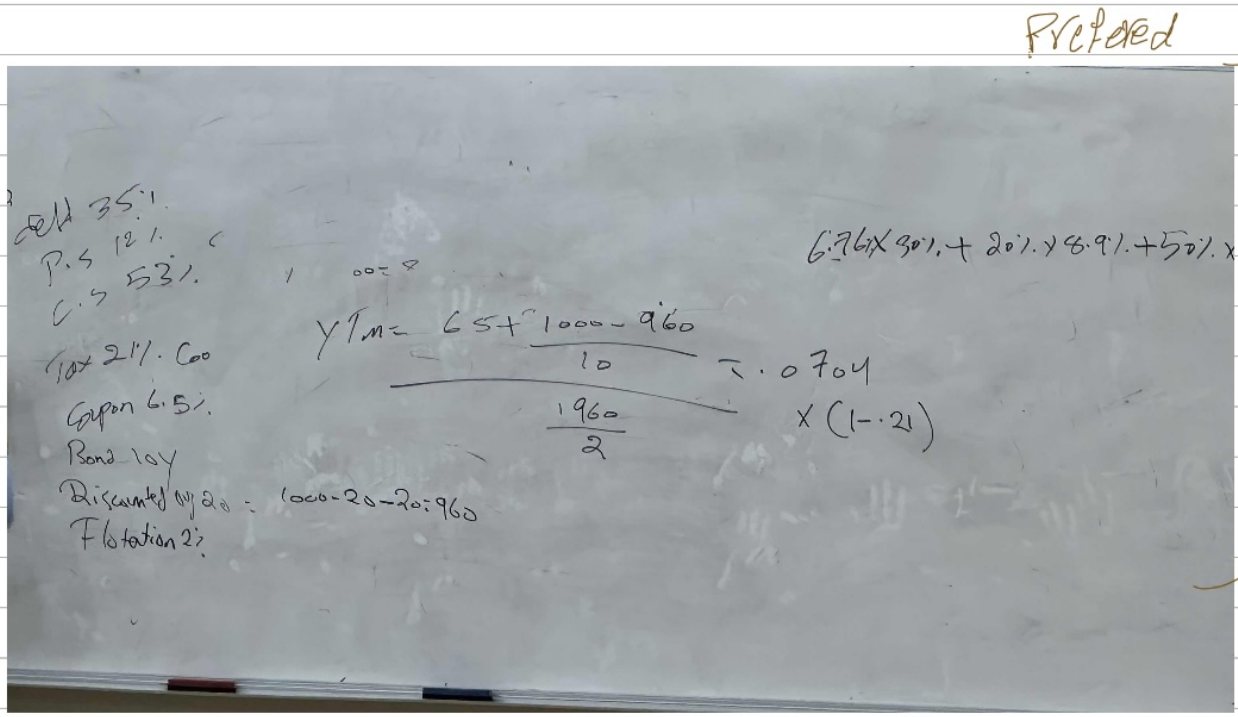
Common stock The current price of Nova's common stock is $35 per share. The cash dividend is expected to be $3.25 per share next year. The firm's dividends have grown at an annual rate of 5%, and it is expected that the dividend will continue at this rate for the foreseeable future. The flotation costs are expected to be approximately $2 per share. Nova can sell new common stock under these terms.

Retained earnings The firm expects to have available $100,000 of retained earnings in the coming year. Once these retained earnings are exhausted, the firm will use new common stock as the form of common stock equity financing. (*Note:* When measuring this cost, the firm does not concern itself with the tax bracket or brokerage fees of owners.)

TO DO

Create a spreadsheet to answer the following questions:

a. Calculate the after-tax cost of debt.
b. Calculate the cost of preferred stock.
c. Calculate the cost of retained earnings.
d. Calculate the cost of new common stock.
e. Calculate the firm's weighted average cost of capital using retained earnings and the capital structure weights shown in the table above.
f. Calculate the firm's weighted average cost of capital using new common stock and the capital structure weights shown in the table above.



chapter 8 تلخيص قوانين

* % R = (Selling Price − Purchase Price) + Yiled / Purchase Price

* Avr ($\bar{R}$) = $\frac{\sum R}{n}$ — no Prob, equal prob

* Avr ($\bar{R}$) = $\sum r \times Prob$ — there is Prob.

* Sd (standard diviasion) = $\sqrt{variance}$ = $\sqrt{(r-\bar{r})^2 \times Prob}$ — there is Prob

- σ^2 : variance
- σ : standard diviasion

* Sd = $\sqrt{\frac{\sum(r-\bar{r})^2}{n-1}}$ — noProb, equal Prob

* Coffecient of variation = $\frac{Sd}{Avr}\left(\frac{\sigma}{r}\right)$

* Covariance = $\frac{\sum(r-\bar{r}_a)\times(r-\bar{r}_b)}{n-1}$ — no prob, equal prob.

type of relation

* Covariance = $\sum(r-\bar{r}_a)\times(r-\bar{r}_b)\times prob$ — there is Prob.

* Correlation = $\frac{Covariance}{Sd_a \times Sd_b}$ — strength of relation

- W_p = 100% always

* $R_p = \sum r \times w \rightarrow return_p = (w_a \bar{r}_a) + (w_b \bar{r}_b) + \ldots (w_n \bar{R}_n)$

* $Sd\,p = \sqrt{w_a^2 \sigma_a^2 + w_b^2 \sigma_b^2 + 2 w_a w_b \underline{Cov}}$

↓

* Cov = Correlation $sd_a\, sd_b$

. 6 jesi Variancen % 100 jesi ka

* Total risk = Systiemahic + Unsystimahic.

Market.	Unique (Firm risk)
Undiversifiable.	diversifiable
non Controlable.	Controlable.

* CAPM = RF + Beta $\underbrace{(MR - MF)}_{\text{Premium}}$ MR - MF = Risk Premicum.

MR : Market return

MF : Market free

RF : Risk Free Rate (rate on treasury bills.)

* Beta = $\frac{Cov}{Var}$

- Beta RF = 0
- Beta Market = 1

Yiled to Maturity (YTM):

- Yiled to Maturity [<] Coupon rate → Bond Premium → Price > 1000
- YTM [>] Coupon rate → Bond Discount → Price < 1000
- YTM [=] Coupon rate → Face Value = 1000

Same meanings:

- Interest rate : required rate of return : Cost of Money
- Nominal interest rate : Actual interest rate
- Coupon rate : interest
- Market i : Yiled to Maturity Bond Price قانون
- Price : MV YTM قانون
- Coupon Bond : PMT
- YTM : Priced to Yiled.

Chapter (6)

تاكنيص القوانين

* Real interest rate $= \left(\frac{(1 + \text{nominal rate})}{(1 + \text{inflation})} \right) - 1$

nominal rate : Actual rate

PMT = Coupon rate $\times$ $\frac{\text{face value}}{\text{usually 1000 for the Bond}}$

Coupon Payment

* Bond Price $= \frac{PMT \times \left(1 - \left(\frac{1}{(1+i)^n}\right)\right)}{i} + \frac{1000}{(1+i)^n}$

-when it Semi annual $\rightarrow \left(\frac{PMT}{2}\right), \left(\frac{i}{2}\right), (n \times 2)$.

-when it quartarly $\rightarrow \left(\frac{PMT}{4}\right), \left(\frac{i}{4}\right), (n \times 4)$.

YTM $= \frac{\left(PMT + \left(\frac{\text{face value} - \text{Market value}}{n}\right)\right)}{\left(\frac{\text{face value} + \text{Market value}}{2}\right)}$

n : number of Maturity

MV : Bond Price

-whet it Semi annual $\rightarrow \left(\frac{PMT}{2}\right), \left(\frac{\#\text{of Maturity}}{2}\right)$ also the $\left(\frac{\text{final result}}{2}\right)$

-When it quartarly $\rightarrow \left(\frac{PMT}{4}\right), \left(\frac{\#\text{ of Maturity}}{4}\right)$ & the $\left(\frac{\text{final result}}{4}\right)$

* Current Yiled $= \frac{\text{Coupon Payment}}{\text{Bond Price}}$

ch 7

تكرير: هوانين

* outStanding = Issued − Treasury Stoks

Preferred Stock

- $P = \frac{D}{K}$ — P = Price, K : cost of P.S, required rate of return

- $K = RF + B(MR - RF)$

Perpetuity : discount rate forever.

Common Stock Valuation

DDM :

- Zero growth rate $\underset{\text{Price}}{P} = \frac{D_0}{K}$ (Discount rate)

- Constant growth

$$P = \frac{D_1}{(K-g)}$$

g: growth

$$D_1 = D_0 \times (1+g)$$

$$\rightarrow P = \frac{(D_0 \times (1+g))}{(K-g)}$$

- The higher the g → the higher the P.
- The higher the K → the lower the P.

$D_1 = D_0(1+g)$ / first way /
$D_2 = D_1(1+g)$
$D_3 = D_2(1+g)$

or

$D_1 = D_0(1+g)^1$
$D_2 = D_0(1+g)^2$ / sec way /
$D_3 = D_0(1+g)^3$

- Variable Modle

2 growths

$$\underset{\text{Value of the firm}}{P} = \Sigma P_v D + \left(\frac{(D_n \times (1+g_c))}{K-g} \times \frac{1}{(1+K)^n} \right)$$

$PVD = \frac{D_n}{(1+K)^n}$

- Price of stocks = $\frac{\text{Value of the firm}}{\text{number of stocks}}$

- Price of C.S = Value of the firm − MV(Bond) − MV(P.S)

DFC:

Dividend إذا الشركة ما بتوزع بتقيمها على أساس ...

1. Zero growth → $\frac{FCF}{k}$ → $\frac{\text{Free Cash flow}}{\text{Discount rate}}$

2. Constant

- Free Cash Flow = operating cash flow − Investment Capital Expense.
- Book Value (Historical Cost) قيمة دفترية
- Market ratio = $\frac{\text{Price}}{\text{Book Value}}$

Book Value of the firm = Total Assets − total liabilities → Book Value = equity

- Earning Per share = $\frac{(\text{net income} - \text{Dividends PS})}{\#\ \text{of shares}}$
- Liquidity Value (LV) = Market Value of total Assets − LV of total liabilities
  قيمة حالية

- $\frac{\text{Price Per Share}}{\text{BV Per share}}$ → Industry الناتج بيختلف حسب ال
- $\frac{\text{Price Per share}}{\text{EPS}}$ → PE ration
- $\frac{\text{Price Per share}}{\text{Liquidation Value Per share}}$

How to Calculate Growth (either Constant / Variable)

① $G = 1 - \frac{D}{E} \times ROE$

G = retention ratio × ROE

retention ratio = 1 − payout ratio

payout ratio = $\frac{D}{E}$ → earning

② $\left(\frac{\text{Ending } D}{\text{Begin } D}\right)^{\frac{1}{n}} - 1$

« Chapter 9 »

• Bond → $YTM = \dfrac{PMT + \left(\dfrac{face - NP}{number\ of\ Maturity}\right)}{\left(\dfrac{face\ value + NP}{2}\right)} \times (1 - tax)$

• Cost P.S $K = \dfrac{D_0}{NP}$

• Cost of C.S $K = \dfrac{D_1}{NP} + g$

- NP = MV − flotation amount
- flotation amount = flotation Cost × face

$K = RF + Beta\ (MR - RF)$ over valuation → + , under valuation →

• Cost of R.E $= \dfrac{D_1}{P} + g$ (C.S) الشركة أصدرت أسهم كالها بدون

(Internal) NP مش P ما تستحين جدا في

• $WACC = (YTM \times W_{bond}) + (Cost\ P.S \times W_{PS}) + (Cost_{C.S} \times W_{CS})$

$W_{bond} + W_{C.S} + W_{PS} = 1$ or 100%

, Bond → Debt

• C.S, P.S → Equity

Ch 10

1] Payback period

كم الفترة يلي حسترد فلوس بحوط
قبل يلي بترجيلي الاصلي اسرع

2] Discount payback period

$$= \frac{\text{Investment}}{(1+K)^n}$$

3] Discount operation CF = Σ Discount Payback Period

4] NPV = - Initial Investment + discount operation CF

net Present Value

5] PI = $\frac{\text{discount operation CF}}{\text{Initial Investment}}$ = $\frac{\Sigma \text{Discount Payback}}{\text{Initial Investment}}$

Profitability index

* NPV (-) → reject Project
* NPV (+) → Accept , take higher value.

PI > 1 → Accept , take higher Value.