Chapter 8

Chapter 8

- Risk & Return
  - Returns → Divedence
    → Appreciation of stock price $3 → $ 3.5

- The Company should not give dividend when stock of lost is, he/she shall automatically face higher costs with no revenues.

- Risk Preferences : انواع
  1. Risk averse
     ↳ Rational in decisions, what ever Risk they take they want Return for it. ↑ Return ↑ Risk.

  2. Risk neutral
     ↳ investors choose the investment with higher return regardless of its Risk, r went this much of Return & he wants to Reach it 3% ~~st~~ from. government. individuals ... etc

  3. Risk seekers "lovers"
     ↳ investors prefers investing with greater risk. even if the expected Return is low.
     ex:- investing in a Country that has war. حرب

- Risk is always uncertain. nothing is stable
  Risk = uncertainty.

Risk & Return { Single asset, Portfolio

- To Reduce Risk (تقليل)
  ⇐ we should do "Diversification" (التنوع)

- Returns for single asset
  $= \frac{\text{new } p - \text{old } p}{\text{old } p} = \frac{(P_t - P_{t-1}) + C_t}{P_{t-1}}$

$C_t \rightarrow$ is Dividence Cash flow.

- when they don't give dividence that means C_t = zero

Examples :-

	Beg	End	Dividence
Apple	411.23	532.17	5.30
walmert	60.33	68.23	1.59

note :-
new is End
old is Beg

Returns for epple $= \frac{532.17 - 411.23 + 5.30}{411.23}$

$= 30\%$

Returns for welmert $= \frac{68.23 - 60.33 + 1.59}{60.33}$

$= 15.7\%$

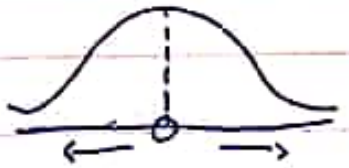
1) Range "Risk" = Pessemestic out come
- optimistic out come

	Asset "A"	Asset "B"
Initial investment C_{f_0}	$10,000	10,000
Annual Return		
↳ pessimistic	13%	7%
↳ most likely	15%	15%
↳ optimistic	17%	23%

Rang = optemestic - pessimestic } Asset "A"
= 17% - 13%
= 4%

Rang = optemestic - Pessemestic } Asset "B"
= 23% - 7%
= 16%

2) probability Distribution



3) Standerd diviation
→

4) Beta → شرح عملي لقدام

3

3) Standard deviation

- rf for a Period

$$\sigma_i = \sqrt{\frac{\Sigma(x - \bar{x})^2}{n-1}}$$

- if for a probability

$$\sigma_i = \sqrt{\Sigma(x_i - \bar{x})^2 * \text{probability}}$$

x_i → Return Asset
$\bar{x}$ → Expected Return

"Step one" X_i → Return for Single asset.

$$X_i = R_i = \frac{(new - old) + CF_t}{old}$$

"Step two" $\bar{X}_n = \frac{\Sigma x_i}{n}$ n → Period

$$\bar{X}_p = \Sigma x_i * \text{Probability}$$

$$\bar{R}_p = \Sigma R_i * \text{Probability}$$

Examples-

Asset "A"

$\bar{R}_i = \Sigma R_i * \text{Probability}$

	Return	Probability	expected Return	
pessemestic	13%	0.25	13% * 0.25	= 3.25%
most likely	15%	0.50	15% * 0.50	= 7.50%
optemestic	17%	0.25	17% * 0.25	= 4.25%
			Σ	= 15%

Asset "B"

	Return	Probability	expected Return	
pessemestic	7%	0.25	7% * 0.25	= 1.75%
most likely	15%	0.50	15% * 0.50	= 7.50%
optemestic	23%	0.25	23% * 025	= 5.75%
			Σ	15%

Both expected Returns are 15% so it doesnt matter in which asset I invest, "A or B"

$\sigma_A = \sqrt{\Sigma (X_A - \bar{X})^2 * \text{Probability}}$ Note: $X_A \rightarrow$ Return

$\bar{X} \rightarrow \Sigma$ expected Ret

X_A	$\bar{X}$	$X_A - \bar{X}$	$(X_A - \bar{X})^2$	Prob	$(X_A - \bar{X})^2 * \text{Prob}$
13%	15%	-2%	4%	0.25	1%
15%	15%	0%	0%	0.50	0%
17%	15%	2%	4%	0.25	1%
					Σ 2%

$= \sqrt{2\%} = \boxed{1.41\%} = \text{Risk.}$

$\sigma_B = \sqrt{\sum (X_B - \bar{X})^2 * Probability}$

X_B	$\bar{X}$	$X_B - \bar{X}$	$(X_B - \bar{X})^2$	Prob	$(X_B - \bar{X})^2 * Prob$
7%	15%	-8%	64%	0.25	16%
15%	15%	0%	0%	0.50	0%
23%	15%	8%	64%	0.25	16%
					$\sum$ 32%

$\sigma_B = \sqrt{32\%} = \boxed{5.6\%} = Risk$

Coefficient of variation $= \frac{\sigma}{\mu} = \frac{5.5\%}{10.47\%} = 0.525 \approx 0.53$

In the question She said, if the Risk is 0.75 or less Shall take it. the Risk is 0.53 so She will make the decision of investing.

* Look σ → is Risk

Examples

if Return "A"

	Return	Risk
A	15%	1.41%
B	20%	5.6%

Coefficient variance "A" $= \frac{\sigma}{R} = \frac{1.41\%}{15\%} =$

$= 0.094$

وحدة القياس بعد العشر

Coefficient variance "B" $= \frac{\sigma}{R} = \frac{5.6\%}{20\%} =$

$= 0.28$

Example:

Year	Begin	End	Dividend
2013	$35	$36.5	$3.50
2014	$36.5	$34.5	$3.50
2015	$34.5	$35	$4

$$\text{Return}_1 = \frac{(36.5 - 35) + 3.50}{35} = 14.3\%$$

$$\text{Return}_2 = \frac{(34.5 - 36.5) + 3.50}{36.5} = 4\%$$

$$\text{Return}_3 = \frac{(35 - 34.5) + 4}{34.5} = 13\%$$

$\Sigma R = \bar{X}$

$14.3 + 4 + 13$

$= 10.43\%$

X = Single R

Year	X	$\bar{X}$	$X - \bar{X}$	$(X - \bar{X})^2$
2013,	14.3%	10.43%	3.9%	15.21%
2014,	4%	10.43%	-6.43%	41.3%
2015,	13%	10.43%	2.57%	6.6%

$\Sigma = 63.11\%$

$n - 1 = 3 - 1 = 2$ Since its period

$$\sqrt{\frac{\Sigma(X - \bar{X})^2}{n-1}} = \sqrt{\frac{63.11\%}{2}} = 5.62\%$$

Portfolio → Return
↳ Risk

$R_{portfolio} = \Sigma (w_i * R_i)$
- w_i → weighted proportion
- R_i → Return of each single asset

Examples :-
100 Shares from Walmart → \$55 / per share = \$ 5,500
100 Shares from Cisco system → \$25 / per share = \$ 2,500

w_i $\frac{5,500}{8000}$ = 68.75 % Total portfolio = 8000

w_i $\frac{2,500}{8000}$ = 31.25 %

Page 374 - given in question "0.50"

Year	Asset x_1	Asset y_1	R portfolio	Expected R
2014	8%	16%	(0.50 * 8%) + (0.50 * 16%)	= 12%
2015	10%	14%	(0.50 * 10%) + (0.50 * 14%)	= 12%
2016	12%	12%	(0.50 * 12%) + (0.50 * 12%)	= 12%
2017	14%	10%	(0.50 * 14%) + (0.50 * 10%)	= 12%
2018	16%	8%	(0.50 * 16%) + (0.50 * 8%)	= 12%

$\bar{R}_p = \frac{\Sigma R_i}{n} = \frac{12\% + 12\% + 12\% + 12\% + 12\%}{5} = \frac{60\%}{5} = \%12$

$\sigma_p = \sqrt{\frac{\Sigma (X_i - \bar{X})^2}{n-1}} = \sqrt{\frac{(12\% - 12\%)^2 + \text{--- 5 times}}{5-1}} = \sqrt{\frac{0\%}{4}} = 0\%$

Year	R_y	R_x	$R_{portfolio\ xy}$	
2014	8%	8%	(0.50 * 8%) + (0.50 * 8%)	= 8%
2015	10%	10%	(0.50 * 10%) + (0.50 * 10%)	= 10%
2016	12%	12%	(0.50 * 12%) + (0.50 * 12%)	= 12%
2017	14%	14%	(0.50 * 14%) + (0.50 * 14%)	= 14%
2018	16%	16%	(0.50 * 16%) + (0.50 * 16%)	= 16%

$$R_p = \frac{8\% + 10\% + 12\% + 14\% + 16\%}{5} = 12\%$$

$$\sigma_{rp} = \sqrt{\frac{(8-12)^2 + (10-12)^2 + (12-12)^2 + (14-12)^2 + (16-12)^2}{5-1}}$$

$$\sigma_{rp} = \sqrt{10\%} = 3.1622 \approx 3.2\%$$

→ Correlation
- Positive Correlation → Same direction
- Negative Correlation → opposite direction

→ Correlation Coefficient
- Perfectly Positively Correlation → +1
- Perfectly Negatively Correlation → -1

Lo unCorrelation = Zero

There's Risk

Example 8-

Year	R bop	R pakki	R pedirco	R bop, pakki	R pakki, pedirco
1	4%	5%	6%	19%	5.3%
2	6%	7.4%	4%	6.6%	6.1%
3	7%	4%	2%	5.2%	3.4%
4	10%	6%	1%	7.6%	4.5%

P_1 → Bop "bank of pakistan" 40%
↳ Pakkal 60%

P_2 → Pakkal → 70%
↳ pedirco → 30%

$\bar{R}_1 = 9.6\%$ $\bar{R}_2 = 4.825\%$

$$\sigma_1 = \sqrt{\frac{(19\% - 9.6\%)^2 + (6.6\% - 9.6\%)^2 + (5.2\% - 9.6\%)^2 + (7.6\% - 9.6\%)}{4 - 1}}$$

$$\sigma_1 = \sqrt{\frac{88.36 + 9 + 19.36 + 4}{3}} = 6.34\%$$

$$\sigma_2 = \sqrt{\frac{(5.3\% - 4.825\%)^2 + (6.1\% - 4.825\%)^2 + (3.4\% - 4.825\%)^2 + (4.5\% - 4.825\%)}{4 - 1}}$$

$$= \sqrt{\frac{0.225 + 1.62 + 2.03 + 0.105}{3}} = \sqrt{\frac{3.98}{3}} = 1.15\%$$

$- CV_1 = \frac{\sigma}{\bar{r}} = \frac{6.34\%}{9.6\%} = 0.66$ $- CV_2 = \frac{\sigma}{R} = \frac{1.15\%}{4.825\%} = 0.238$

Seconed portfolio is the best choice because it has lower σ & CV.
So → lower Risk.

Risk & Return

- CAPM → Capital asset pricing method.

R_s = Return of the asset "stock"

Note :. $(R_m - R_f)$ is called ↳ market Risk premium.

$R_s = R_f + Beta * (R_m - R_f)$

- R_s → Return of the asset
- R_f → Risk Free → treasury bills. treasury bond → سندات الخزينة
  → Government bond.
- R_m → The market index → Al-Quds index

- Beta → Risk

Total Risk = Diversifiable risk + Nondiversifiable Risk
= Nonsystematic Risk + Systematic Risk
= Specific Risk + market Risk

* Beta only measures the Nondiversifiable Risk

Beta بتراوح بين 2 , -2 Beta قيمة

-2 → Return عكس the market

+2 → Return same direction of the market

Beta for the market = 1

B = 1.5 → if the market increase by 1 , it will go up by 1.5

B = -1.5 → if the market increase by 1 , it will go down by 1.5

Example:

	Beta	Total investment	weighted
Amazon	0.82	50,000	25%
E-bay	0.87	40,000	20%
Intuit	0.99	20,000	10%
Microsoft	1.18	60,000	30%
Yahoo	0.89	30,000	15%
		£ 200,000	

Beta Portfolio = $\Sigma(w_i * Beta_i)$

= 0.965

weighted = $\frac{50,000}{200,000}$ = 25% $\frac{20,000}{100,000}$ = 10%

$\frac{40,000}{200,000}$ = 20% $\frac{60,000}{100,000}$ = 30%

$\frac{30,000}{100,000}$ = 15%

Example Portfolio V Portfolio W Page 365

Asset	Proportion	Beta	Proportion	Beta
1	0.10	1.65	0.10	0.80
2	0.30	1.00	0.10	1.00
3	0.20	1.30	0.20	0.65
4	0.20	1.10	0.10	2.75
5	0.20	1.25	0.50	18.05

Example :

Beta = 1.5

R_F = 7%

Rm = 11%

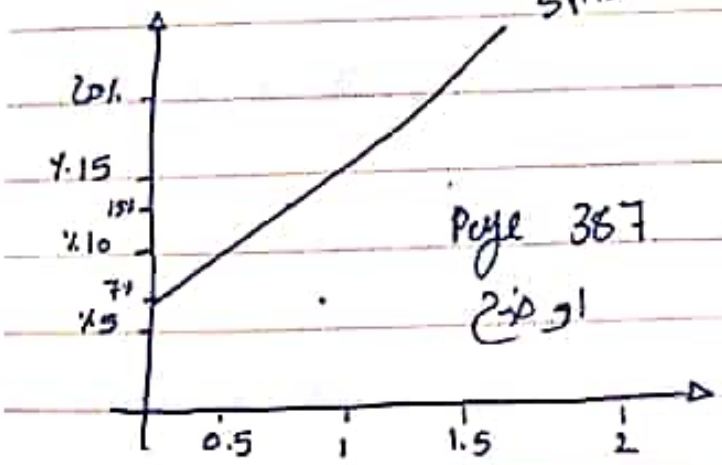
R_i = ??

R_i = 13%

$R_i = R_F + \text{Beta}\,(R_m - R_F)$

$= 7\% + 1.5\,(11\% - 7\%)$

$= 13\%$



Security market line

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Fig 9.1

Δ Risk Free =

"Actual" Nominal Rate = Real rate + Expected inflation

Example range ~~888~~. Problems solution.

PS-4

A) $Range_A$ = optimistic − Pessimistic
= 24% − 16%
= 8%

$Range_B$ = 30% − 10%
= 20%

B) Project A is less Risky because the range is lower
$Range_A < Range_B$

C) Project A. Since its less Risky

D) We Remains the Same.

PS-7

A) $-CV_A = \frac{\sigma}{\mu} = \frac{7\%}{20\%} = 0.35$.

$-CV_B = \frac{\sigma}{\mu} = \frac{9.5\%}{20\%} = 0.475$

$-CV_C = \frac{\sigma}{\mu} = \frac{6\%}{19\%} = 0.316$

$-C_D = \frac{\sigma}{\mu} = \frac{5.5\%}{16\%} = 0.344$

B) Alternative C because it has less Coefficient of variation.

P8-9 CV below 0.9

A) $R_{12} = \frac{(21.55 - 14.36) + 0}{14.36} = 50\%$

$R_{13} = \frac{(64.78 - 21.55) + 0}{21.55} = 200\%$

$R_{14} = \frac{(72.38 - 64.78) + 0}{64.78} = 11.73\%$

$R_{15} = \frac{(91.8 - 72.38) + 0}{72.38} = 26.8\%$

B)

Year	Return	Probability	R * P
2012	50%	0.25	12.5%
2013	200%	0.25	50%
2014	11.73%	0.25	293%
2015	26.8%	0.25	6.7%

$\Sigma = 72.13\%$ → expected Return

C) $\bar{R} = \sqrt{\frac{\Sigma (X_i - \bar{X})^2 * Prob}{n-1}}$

$\bar{R} = \frac{50\% + 200\% + 11.73\% + 26.8\%}{4} = 72.13\%$

	$R_i - \bar{R}$	$(R_i - \bar{R})^2$
2012	22.06%	0.49
2013	1.284%	1.635
2014	-6.1%	0.365
2015	-45.3%	0.2

$$\sigma = \sqrt{\frac{6.49 + 1.635 + 0.365 + 0.2}{4-1}} = \sqrt{\frac{2.69}{3}} = 0.95$$

D) $CV = \frac{\sigma}{R} = \frac{0.95}{0.7213} = 1.3$

E) Coefficient of variation is greater than 0.9
So it is risky.

P 8-21

A)

Asset	B	(b)	(A)
W	0.9	0.09% ↑	-0.09 ↓
X	-0.6	-0.06 ↓	0.06 ↑
Y	1.8	0.18 ↑	-0.18 ↓
Z	2.3	0.23 ↑	-0.23 ↓

C) I would prefer asset (X) because it is moving opposite the market. So the return will increase.

D) I would prefer asset (Z) because it will be increased the most.

Chapter 6

Chapter 6

Interest Rates & bond valuation

- Debt security "obligation"

1 → Money market securities "Short term security" — Debt sec الاستثمار

less than one year

* Treasury bills "T. bills" → Risk ↓
  issuer is the government
* Negotiable Certificate of Deposit → Risk
  issuer is Deposit or institutions
* Commercial paper
  issuer: high quality corporations
  note: its an unsecurity promissory.

2 → Capital market securities
"long term"

* Bonds
  - Treasury bond
    issuer: government
  - Municipal البلدية bond
    issuer: local government
  - Corporate bond
    issuer: Corporations

principal ($)
interest (%)
maturity (n)

- Interest Rate
- Coupon Rate
- Discount Rate
- Yield to maturity

كلهن نفس الكلمة

⇒ Nominal interest Rate = Real interest Rate + expected inflation

Example :
ABC bond

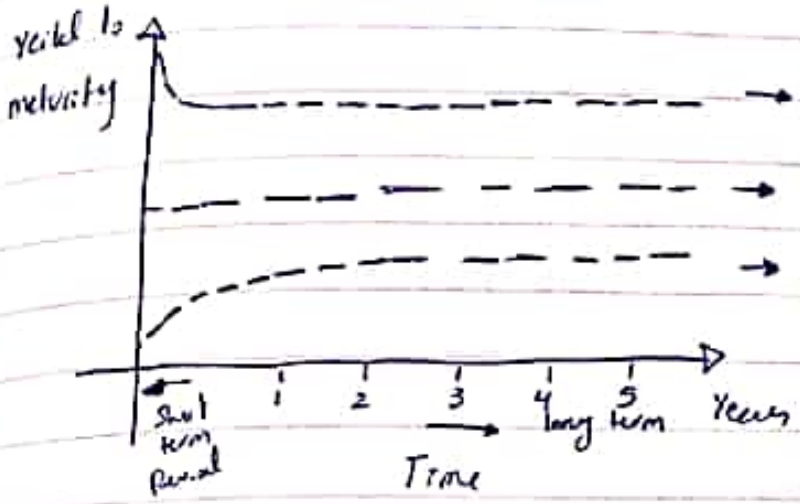
principal "Face value" = $1000
interest = 6%
maturity = 3 years

This is for the ones with Risk free Treasury bonds & treasury bills

Nominal interest rate = Real interest Rate + expected inflation
4% = 2% + 2%

Nominal interest rate = Real Interest + expected inflation + Risk Premium
6% = 2% + 2% + 2%

→ Term structure of the intrest Rate.



- inverted → Yeild curve ↓
  intrest in short term > intrest in long term / downward

- normal → intrest in short term < intrest in long term /upward

- flat → intrest in short term = intrest in long term

* why is here normal Yield Curve
  - Expectation Theory.
  - Liquidity Perfrence Theory.
  - Market segmentation Theory.

* Expectation Theory
  1 → investor think about Returns
  intrest Rate in future will increase what do: do now?
  I invest in the short term now until thy intrest Rate increase

2- if im an issuer :- ~~cost~~ Thinks about cost
i invest in the long term right away

* liquidity preference theory
حسب بقدر الاحمل احمل ال security واحولها لكاش
بزيد ال Risk عليه

* Market segmentation theory
- insurance ⌐ → long term
- pension ⌙
- Banking industry ⌐ → short term security

في قطاعات بتفرق بين long term وفي قطاعات بين short term.

* Default Risk "Credit"
هو احتمالية يكون الـ Creditor غير قابل لرجاع المال $ و الـ interest
issuer to give back the $ & interest.

* maturity Risk :
احتمالية التعرض لـ Risk في فترة الاستحقاق

* Contractual provision Risk :-
issuer تتحمله اكثر شيء بحطوا شروط لل issuer.

1- Cost of Debt < cost of equity

- Corporate bond
  * principal "face value"
  * Coupon interest Rate
  * Maturity

- Structured debt provisions.
  ↳ Restrictive covenants

Revenues
- Cost of goods sold → Common stock holders [3]

Gross Profit
- operating Expenses

EBIT
- Intrest Expense → Tax deductible [1]
اول ناس بدفعولهم هم الـ Bond holders

EBT
- Tax

Earnings after tax
- Preferred div → Preferred stock holders. [2]

Earnings available for Common stock.

* Trustee → Bond Holder طرف ثالث بين الشركة و الـ
بحمي حقوق الطرفين

* Cost of bond of the issuer

1. Maturity → كل ما زادت الفترة ← كل ما بيعمل تعديلات اكتر وبيزيد الخطر عليه

2. Impact of offering size
حجم المعاملات اللي بقدر اقترضها "اوخدها"

3. Impact of issuer Risk
يعتمد على وضع الشركة المدين ← كل ما كان الوضع احسن كل ما يقل الـ Risk

4. Impact of cost of money
الـ Interest Rate اللي بيحطها بدفعها على القرض

---

* خصائص القرض اللي ممكن يحملها

[1.] Conversion feature
→ امكانية تحويل الـ Bonds ← Stocks
ownership تحويل من obligation ← Equity
تحويل من Creditors ← owners
∴ pay Dividends Rather than interest ✓
تحويل من Debt ← Equity

[2] Call Feature
→ ارجع اشتري اللي في السوق
→ خطواتها
1. Call price
→ المعاري اللي بدفعهم عشان ارجع الـ Bond
2. Call premium → الفرق بين الـ Call Price و Parvalue
بدفعه للمستثمرين (استرجاع السندات)

7

* Current Yield = $\frac{\text{Annual interest payment}}{\text{current price}}$

"investor"

- Yield to maturity = Cost of Debt "issuer"

- Call Yield

* Example:-

Face value - $ 1000 } → Annual interest payment

Coupon interest = 8%

Current price = $ 970

- Current Yield

Current Yield = $\frac{(\text{face value} * \text{Coupon interest})}{\text{Current price}}$

$= \frac{(\$1000 * 0.08)}{\$970} = 8.25\%$

/ /

* Types of bonds :-
  ↳ unsecured bonds
  ↳ secured bonds

- unsecured bonds
  - Debentures → مدعومة بسمعة الشركة
  - Subordinated debentures → بيتدفع هاد الدين بعدما يندفع للأوائل بالأهمية
  - Income bonds → حسب دخل الشركة

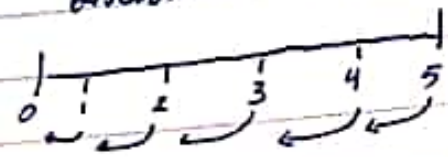
- Secured bond
  - mortgage bond → مرهونة بأرض أو مبنى إذا ما اندفعت بنبيع الأرض عشان نرجع
  - Collateral trust bond → بتكون مرتبطة في سند ثاني
  - Equipment trust Certificates → مرهونة في Equipment

Bonds
- Zero Coupon bond → مفش فيه Risk
- Junk bond → اعلى Risk عليه
- Floating Rate bond → حسب سعر الفائدة في السوق

* High yield bond = junk bond.

* Eurobond → بصدر في عملتي انا وين ما بروح
*
الا اذا في قوانين تمنع ذلك
* Foreign bond → بصدر في عملة الدولة اللي انا رايح عليها

* Bond Valuation &
Discounted → Present Value.
Discanted of Future Cash flow



present value envity → اقساط / دفعات
Present value Single amount → Future is Single amount

Bond
* "principal" Face value $1000
* Coupon rntrest Rate 7.4
* Maturity 4 years

* Bond price "Bond Vale" = $\sum_{K,n}$ (PVIFA) + Par value $_{K,n}$ (PVIF)

I → Coupon ~~rntrest~~ payment = (Coupon rntrest * Face value)
Par value
(PVIFA) → present value rntrest factor of envity
K → Yield to maturity
n → Period "maturity"
Par Value → Face Vale, principal
(PVIF) → Present Value rntrest factor ⇒ PV = $\frac{Fv}{(1+k)^n}$

mixed stream (PVA) = $\sum \frac{Fv}{(1+k)^n}$
i

when we have Same Payment = $PMT\left[\frac{1}{K} - \frac{1}{K(K+1)^n}\right]$

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3 Examples
Work
امثلة

① Example:
Par value = $1000
Coupon rate = 10%
maturity = 10 years
Yield to maturity = 10%

$$(PVA) = PMT\left[\frac{1}{K} - \frac{1}{K(1+K)^n}\right]$$

$$= 100\left[\frac{1}{10\%} - \frac{1}{10(1+0.10)^{10}}\right] = 614.46$$

$$\text{par value} = \frac{FV}{(1+k)^n} = \frac{1000}{(1.1)^{10}} = 385.5$$

Bond Price = 385.5 + 614.46
= 999.9 ≈ $1000

② Example:
Coupon rate = 10%
Yield of maturity = 12%

$$\Sigma(PVIFA) = PMT\left[\frac{1}{K} - \frac{1}{K(1+K^n)}\right]$$

$$= 100\left[\frac{1}{0.12} - \frac{1}{(0.12+1)^{10}}\right] = 565$$

$$\text{Par value} = \frac{FV}{(1+K)^n} = \frac{1000}{(1.12)^{10}} = 322$$

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Bond Price = 565 + 322

= $887 Discount

3 Coupon intrest = 10%

Yield to maturity = 8%.

$$PV = Pmt\left[\frac{1}{K} - \frac{1}{K(1+K)^n}\right]$$

$$= 100\left[\frac{1}{0.08} - \frac{1}{0.08(1+0.08)^{10}}\right] = 671$$

$$PVIF = \frac{1000}{(1+0.08)^{10}} = \$463.2$$

Bond price = 671 + 463.2

= 1134.2 → Premium.

→ Yield to maturity = Coupon rntrest

Bp "Bond Price" = pv value "face value"

→ Yield to maturity > Coupon intrest

Bp "bond price" = Discount Bond price < Fv

→ Yield to maturity < Coupon intrest

Bp "bond price" = Premium

Face Value الى فوق

Bond. Price > Fv

السعر في الدوف اذا اكل ست تاني Dejment بترجع
اذا اعلى ما بترجع .

Pole
Problems
P6-3

A) $\frac{100}{25} = 4$ Shirts

B) $PV = \frac{FV}{(1+K)^n} = 100 = \frac{FV}{(1+0.09)^1} = \$109 = FV$

C) $PV = \frac{FV}{(1+K)^n} = 25 = \frac{FV}{(1+0.05)^1} = FV = \$26.25$

D) At the end of the year we have

$\frac{109}{26.25} = 4.15$

Percentage $= \frac{4.15-4}{4} = 0.038$

3.8% more Shirts

E) Real Rate + inflation Rate = Nominal Rate

Real + 5% = 9%

Real = 4%

Q6 - E

A) Rate of Return = Real rate + inflation rate

4% = Real rate + 2%

2% = Real rate

B)

Security	Real Rate	+ inflation Rate	+ Risk Premium	= Nominal
A	2%	6%	4%	= 12%
B	2%	5.5%	5%	= 12.5%
C	2%	5%	2%	= 9%
D	2%	4.8%	3%	= 9.8%
E	2%	6%	6%	= 14%

C) Because the liability security have different maturity.

Chapter 7
Stock valuation

Chapter 7

Stock → Equity → common stock
preferred stock
"ownership"

- Difference between Equity & Debt
Equity → "ownership", Return → "Dividens, Appriciation of stock price"
, no maturity, Claim on interest & Asset, Tax treatment
Debt → "obligation", Return → "coupon pmT", maturity, Claim on income & Assets, Tax treatment.

* Common Stock & Preferred Stock

- Common Stock
1. privately owned
↳ owned by private investors. Not publicly traded.

2. publicly owned (stock)
↳ owned by public investors, Publicly traded.
stock اي بده يقلك متل لكل الناس وبتنزل

3. closely owned (stock)
↳ individual or small group of investors, privetly owned.

4. widly owned (stock)
↳ many unrelated individuals or insitutional investors.

* Preemptive Rights *

ذا بدعب انزل اسهم جديدة الاولوية واكي الم حت يشتروف
هم اكي حاطلي الاسهم الحالية .

* Ownership *

Earnings per share و Dividends قبل الـ Number وعدد بزيد عدد الاسهم

* انواع اسهم الشركة بتقسم

1. Authorized Shares :- المصرح به
   ↳ Shares of common stock that are allowed to issue.

2. Outstanding Shares :-
   ↳ issued shares of common stock held by investors.
   it includes both private & public investors.

3. Treasury stock :-
   ↳ issued shares of common stock held by the firm
   Repurchased shares by the firm.

4. Issued shares :-
   ↳ Shares of common stock that are put into circulation
   the sum of outstanding shares & Treasury stock.

- Preferred Stock

1. No voting Rights

2. Dividends
   - % of Par value
   - Amount $1 / share.

3. Cumulation
   - Cumulative preferred stock.
   = Non Cumulative preferred stock.

4. other features
   - Callable
     to Retire Shares on a specific Period with a specific Price.

   - Conversion
     Changes each Share into a stated number of shares of common Stock.

- IssuenCo
  - Direct — قررت تصدر اسهم في الكتاب العام
    ABC Company ⇄ (stocks → / ← money) Investors
    ↳ Could be individuals or institutions.
  - Indirect → تكون في وسيط بالمرور الاسهم

→ Investment banking firm الشركة بتروح لـ

ABC company ⟵ Money ⟵ Investment banking firm ⟵ Money ⟵ ABC Stocks ⟵ Investors

الاتفاقية اسمها
underwriting agreement.

Ipo لـ ع الشركة بتساعد
↳ Initial public offering

* Zero growth model

$$P_s = \frac{D_1}{R_s}$$

Example: $P_s = \frac{\$3}{0.15} = \$20$

P_s → Price of the stock
→ Dividends
→ Required rate of Return.

* Constant Growth model

Year	Dividends per share
2015	$ 1.40
2014	$ 1.29
2013	$ 1.20
2012	$ 1.12
2011	$ 1.05
2010	$ 1

* $P_s = \frac{D_1}{R_s - g}$

P_s → Price of the stock
D_1 → Dividends of the next year
$D_1 = D_0 (1+g)^n$
D_0 → Dividends of the current year
g → Growth of Dividends
R_s → Required Rate of Return
g → Growth of dividends.

Stock

$D_{2015} = D_{2010} (1+g)^5$

$\frac{\$1.40}{1} = \frac{\$1}{\$1} (1+g)^5$

$\$1.40 = (1+g)^5$

$G = 7\%$

$P_s = \frac{D_1}{R_s - g}$

$P_0 = \frac{\$1.40 (1+0.07)}{0.19 - 0.07}$

$P_s = \$ 18.75$ / shares.

Variable growth model.

t	End of year	Dividend	$(1+g)^n$	D_t
1	2016	$1.50	$(1+0.10)^1$	= $1.65
2	2017	$1.50	$(1+0.10)^2$	= $1.82
3	2018	$1.50	$(1+0.10)^3$	= $2

step one.

D_{2015} = $1.50 / share
g_1 = 10% (2016, 2017, 2018)
g_2 = 5%
R_s = 15%
P_0 = P_{2015} ??

$$PV = \frac{FV}{(1+R_s)^n}$$

$(1+R_s)^n$	Original Dividends	PV Dividends
$(1+0.15)^1$	$1.150	$1.45
$(1+0.15)^2$	= $1.323	$1.37
$(1+0.15)^3$	= $1.521	$1.32

Σ 4.12

Step 2

$$D_{2019} = D_{2018}(1+g)^n$$
$$= \$2\ (1+0.05)^1$$
$$= \$2.10$$

Future → growth Rate
Discounting process → Required Rate of Return
'PV'

$$P_{2018} = \frac{D_{2019}}{R_s - g} = \frac{D_{2019}}{0.15-0.5}$$

$$P_{2018} = \frac{\$2.10}{0.10} = \$21$$

$$P_{2015} = \frac{P_{2018}}{(1+0.15)^n} = \frac{\$21}{(1+0.15)^3} = \$13.81 + \$4.12 = \$17.93$$

→ Free Cash flow valuation model

Year	FCF	$(1+0.09)^t$	PV FCF
2016	$400.000	÷ $(1+0.09)^1$	$ 366.972
2017	$450.000	÷ $(1+0.09)^2$	$ 378.788
2018	$520.000	÷ $(1+0.09)^3$	$ 401.539
2019	$562.000	÷ $(1+0.09)^4$	$ 396.718
2020	$600.000 + 10.300.000	÷ $(1+0.09)^5$	$ 7.084.252

Step#3

= 10.900.000

VC ≈ $8.628.232

→ G_{2020} = 3% . Required Rate of Return = 9%

→ Market Value of all Debt = 3.100.000

→ Market Value of preferred stock = 800.000

→ # of shares CS = 300.000

→ V_S = $V_C - V_D - V_P$

Common stock — Cash flow — Debt — Current Preff

معطيات

Step #1

$$FCF_{2020} = \frac{FCF_{2020}(1+0.03)^1}{0.09-0.03} =$$

$$= \frac{600000\ (1+0.03)^1}{0.09-0.03} = \$10.300.000$$

Step #2

FCF_{2020} = $600.000 + $10.300.000

= $10.900.000

Step4#

$V_S = V_C - V_d - V_P$

V_S = $8.628232 − 3100.000 − 800.000

V_S : $4.728.232

Vs/share

= $4.728.232 / 300.000

= $15.76

7

→

Book Value per share = $\frac{6,000,000 - 4,500,000}{100,000}$

= $15 per share

→

Liquidation value per share = $\frac{\$5,250,000 - \$4,500,000}{100,000}$

= $7.5

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