(1)

Return%	Prob	PR	d(Return-$\bar{R}$)	d^2	Pd^2
6	0.1	0.6	-2	4	0.4
7	0.25	1.75	-1	1	0.25
8	0.3	2.4	0	0	0
9	0.25	2.25	1	1	0.25
10	0.1	1	2	4	0.4
	ΣPR	8		ΣPd^2	1.3

Return 8%

Risk $\sqrt{1.3}$ = 1.14%

Return > Risk, so investment can be done in these company.

(2) 3/26/2021

Return	Prob	PR	d	d^2	Pd^2
4	0.1	0.4	-4	16	1.6
6	0.2	1.2	-2	4	0.8
8	0.4	3.2	0	0	0
10	0.2	2	2	4	0.8
12	0.1	1.2	4	16	1.6
	ΣPR	8		ΣPd^2	4.8

Return - 8%

Risk $\sqrt{4.8}$ = 2.19

Cmpy A

③ Return	Prob	PR	dx	d^2	Pd^2
4	0.1	0.4	-2.4	5.76	0.576
2	0.2	0.4	-4.4	19.36	3.872
6	0.3	1.8	-0.4	0.16	0.048
8	0.1	0.8	1.6	2.56	0.256
10	0.3	3	3.6	12.96	129.6
	ΣPR	6.4		ΣPd^2	4.496

Return - 6.4%

Risk = $\sqrt{4.496}$ = 2.12

cmy b

Return %	Prob	PR	dy	d^2	Pd^2
6	0.1	0.6	-6.1	37.21	3.721
8	0.2	1.6	-4.1	16.81	3.362
10	0.3	3	-2.1	4.41	1.323
15	0.1	1.5	2.9	8.41	0.841
18	0.3	5.4	5.9	34.81	10.443
	ΣPR	12.1		ΣPd^2	19.69

Return = 12.1%

risk = $\sqrt{19.69}$ = 4.43

dx dy (dx x dy)	P dx dy
14.64	1.464
18.04	3.608
~~4.41~~	0.252
0.84	0.464
4.64	6.372
21.24	
	12.16

cov

"correlation" $= \frac{12.16}{2.12 \times 4.43} = \frac{12.16}{9.3916} =$

1.2947

correlation $= \frac{\text{cov AB}}{\text{std A} \times \text{std B}}$

(4) A stock costing Rs 50 pays no Dividend the possible prices and end of yrs Prob are

End of the year	Prob	Return%	PR	d (R-PR)	d^2	Pd^2
60	0.1	20	2	11.17	124.7689	12.48
65	0.2	8.33	1.666	-0.50	0.25	0.05
70	0.4	7.69	3.076	-1.14	1.2996	0.52
75	0.2	7.14	1.428	-1.69	2.8561	0.571
80	0.1	6.66	0.666	=2.17.	4.7089	0.471
		ΣPR	8.836		ΣPd^2	14.08889

Return% = $\frac{\text{Today's price} - \text{yesterday price}}{\text{yesterday's price}} \times 100$

i) $= \frac{60-50}{50} \times 100 = 20$

ii) $\frac{65-60}{60} \times 100 = 8.33$

iii) $\frac{70-65}{65} \times 100 = 7.69$

iv) $\frac{75-70}{70} \times 100 = 7.14$

v) $\frac{80-75}{75} \times 100 = 6.66$

Return = 8.83%

Risk = $\sqrt{14.0884}$ = 3.75340179 %

= 3.75%

③ Company A

Return	prob	PR	dx	d^2	Pd^2
4	0.1	0.4	-2.4	5.76	0.576
2	0.2	0.4	-4.4	19.36	3.872
6	0.3	1.8	-0.4	0.16	0.048
8	0.1	0.8	1.6	2.56	0.256
10	0.3	3	3.6	12.96	3.888
		$\Sigma PR = 6.4$			$\Sigma Pd^2 = 8.64$

return = 6.4%

risk = $\sqrt{18.64} = 2.9393$.

Company B :-

Return	prob	PR	dy	d^2	Pd^2
6	0.1	0.6	-6.1	37.21	3.721
8	0.2	1.6	-4.1	16.81	3.362
10	0.3	3	-2.1	4.41	1.323
15	0.1	1.5	2.9	8.41	0.841
18	0.3	5.4	5.9	34.81	10.443
		$\Sigma PR = 12.1$			$\Sigma Pd^2 = 19.69$

return = 12.1%

risk = $\sqrt{19.69} = 4.43\%$

dxdy	Pdxdy
14.64	1.464
18.04	3.608
0.84	0.252
4.64	0.464
21.24	6.372
$\Sigma Pdxdy =$	12.16

-) covariance = 12.16

correlation = $\frac{12.16}{2.93 \times 4.43}$

$= \frac{12.16}{12.9799}$

$= 0.936833$

-) co-relation = 0.936833

3/30/2021

(2) End of the yr

Price	Prob	Return %	PR	d	d^2	Pd^2
120	0.2	4.347	0.8694	~~-~~3.1006	9.6137	1.922
135	0.3	12.5	3.75	5.0524	25.526	7.65
155	0.1	14.81	1.481	7.3624	54.204	5.42
170	0.2	9.677	1.9354	2.2294	4.970	0.994
165	0.2	-2.941	-0.5882	-10.3876	107.92	21.58

$\Sigma PR = 7.4476$ (return)

$\Sigma Pd^2 = 37.566$

$\sigma = \sqrt{37.566} = 6.1$

Return %

i) $= \frac{120-115}{115} \times 100 = \frac{5}{115} \times 100 = 4.347$

ii) $\frac{135-120}{120} \times 100 = \frac{15}{120} \times 100 = 12.5$

$\frac{155-135}{135} \times 100 = \frac{20}{135} \times 100 = 14.81$

$\frac{170-155}{155} \times 100 = \frac{15}{155} \times 100 = 9.677$

$\frac{165-170}{170} \times 100 = \frac{-5}{170} \times 100 = -2.941$

(6) (Sum)

Return	$d(R-\bar{r})$	d^2
12	-5 (12-17)	25
14	-3	9
16	-1	1
18	1	1
20	3	9
22	5	25
Total = 102		$\Sigma d^2 = 70$

(When probability not given.

$\text{Return} = \frac{102}{6} = 17.$

$\text{SD} = \sqrt{\frac{70}{6}} = 3.41$

②	yr	Return	(d-r)	d^2
um)	1	14	-4.6	21.16
=	2	15	-3.6	12.96
	3	18	-0.6	0.36
	4	21	2.4	5.76
	5	25	6.4	40.96
		93		$d^2 = 81.2$

$$\text{return} = 18.6 = \frac{93}{5}$$

$$\text{Risk} = \frac{81.2}{5} = \sqrt{16.24} = 4.029$$

$$= 4.11$$

(8) (em)

Yrs	A return	(d-r) dx	d2
1	12	-3.5	12.25
2	19	3.5	12.25
3	17	1.5	2.25
4	15	-0.5	0.25
5	16	0.5	0.25
6	14	-1.5	2.25
	Total = 93		Total = 29.5

Company B Yrs	B Return	(d-r)dy	d2
1	15	-5.66	32.03
2	18	-2.66	7.075
3	22	1.34	1.795
4	25	4.34	18.83
5	24	3.34	11.15
6	20	-0.66	0.435
	Total = 124		71.315

$$\text{Return} = \frac{93}{6} = 15.5$$

$$\text{Risk} = \sqrt{\frac{29.5}{6}} = \sqrt{4.9166} = 2.217$$

$$\text{Return} = \frac{124}{6} = 20.66$$

$$\text{Risk} = \sqrt{\frac{71.315}{6}} = \sqrt{11.88} = 3.446$$

dxdy

$(-3.5 \times -5.66) = 19.81$

$(3.5x - 26.6) = -9.31$

$(1.5 \times 1.34) = 2.01$

$(-0.5 \times 4.34) = -2.17$

$(0.5 \times 3.34 = 1.67$

$(-1.5 \times -0.66) = \underline{0.991}$

$\underline{13}$

Covariance $= \frac{\Sigma dx \times \Sigma dy}{N}$

$= \frac{13}{6} = 2.16$ //

Co-relation $= \frac{2.16}{2.217 \times 3446} = \frac{2.16}{7.639} = 0.282$

8th April

(9)

Sum) Yr	A Return	d(R-R̄)	d²
1	6	-2	4
2	7	-1	1
3	8	0	0
4	9	1	1
5	10	2	4
			Total = 10

Total = 40

Return = $\frac{40}{5} = 8$.

Resk = $\sqrt{\frac{10}{5}} 2 = 1.414$

dx dy
8
2
0
2
8

B	d(R-r)	d²
4	-4	16
6	-2	4
8	0	0
10	2	4
12	4	16
40		40

Total = $\frac{40}{5} = 8$.

Resk = $\sqrt{\frac{40}{5}} 8$.

$\sqrt{8} = 2.236$

$= 2.82$

$\frac{20}{5} = 4$ // covariance $= \frac{\Sigma dx \times \Sigma dy}{N} = \frac{20}{5} = 4$.

Correlation coeff

$$= \frac{4}{2.82 \times 1.414} = \frac{4}{3.987} = \frac{4}{4} = 1.$$

Unit II

PV @ 18% $\frac{1}{1.18}$

Q1)

Yr	Int	PV @ 18%	PV
1	100	0.8474	84.74
2	100	0.7181	71.81
3	100	0.6086	60.86
4	100	0.5157	50.57
5	100	0.4371	43.71
6	100	0.3704	37.04
7	100	0.3139	31.39
8	1100 (1000 + 100) FC	0.266	292.6

Total value of Bond 673.72

Decision Not Purchase.

Because in question bond Rs 874.75 How we got 673.72 so Not purchase.

1.) The par value of the Bond is Rs 1000 with coupon with coupon rate is 10% maturity of 8yrs. YTM is 12%. Find the value of the Bond and suggest Investor can purchase it when the market price is Rs. 874.75.

(2) The par value of the bond is Rs 1000 with coupon rate is 10% maturity of 5yrs. YTM is 8% find the value of the bond and suggest if investor can purchase it when the market price is Rs. 1035.66.

Sol)

year	Int	PV@8% $\frac{1}{1.08}$	PV (PV@ x Int)
1	100	0.9259	92.59
2	100	0.8573	85.73
3	100	0.7938	79.38
4	100	0.7350	73.50
5	1100	0.6805	748.55
		value of the Bond.	901.53
		Decision	Not to purchase the Bond. Because the market price is 1035.66.

3) The par value of the bond is Rs. 1000 with coupon rate is 10% maturity of 5yrs. YTM is 15%. Find the value of the Bond and suggest if investor can purchase it when the market price is Rs. 918.71.

Yr	Interest	PV@ 15% $\frac{1}{1.15}$	PV
1	100	0.8695	86.95
2	100	0.7561	65.75
3	100	0.6575	57.17
4	100	0.5717	546.81
5	1100	0.497	

Value of the Bond. 832.29.

Decision NO

9th April

Problems on YTH and AYTH.

YTH = Yield to Maturity (rate of return)

YTC = Yield to call

$YTM = \frac{LR + PVLR - MP * DR - 1(HR - LR)}{PVLR - PVHR}$

PVLR = present value of lower rate.

PVHR = present value of higher rate.

MP = market price of share

DR = difference on LR and HR

LR = Lower rate.

$AYTH = \frac{I + (RV - SV)/n}{(RV + SV)/2}$

I = interest

RV = Redeemable value

SV = Today MP

N = No of yrs

(10) A 4yrs bond with coupon rate of 7% and the maturity value of 1000 is currently selling at Rs 905. What is YTM?

I = 70 (1000 × 7%)

RV = 1000

SV = 905

N = 4

$$AYTM = \frac{70 + (1000 - 905)/4}{\frac{(1000 + 905)}{2}} \times 100$$

$$= \frac{70 + 23.75}{952.5} \times 100$$

$$= 9.84\%$$

AYTM = 9.84%

LR = 7%

HR = 12% (one% less and one% more)

Yr	Int	PV @ 7% 1.07	PV
1	70	0.9345	61.13
2	70	0.8374	57.12
3	70	0.8162	816.19
4	1070	0.7628	

PVLR = 999.95

Yr	Int	PV @ 12%	PV
1	70	0.8928	62.49
2	70	0.7971	55.79
3	70	0.7117	49.81
4	1070	0.635	679.98

PVHR = 848.07

$$YTM = LR + \frac{PVLR - HP}{PVLR - PVHR} * DR$$

$$= 7 + \frac{999.88 - 905}{999.88 - 948.07} \times 5$$

$$= 7 + \frac{94.88}{151.99} \times 5$$

$$= 7 + (0.625 \times 5)$$

$$= 7 + 3.125$$

$$= 10.125\%$$

$$YTM = 10.13\%$$

2) A Bond with the face value of Rs1000 pays a coupon rate of 9%. The maturity Period is 9 yrs. selling value is Rs. 920 find a) AYTM b) YTM.

Sol) $P = 90$, $RV = 1000$, $SV = 920$, $N = 9$

$$AYTM = 90 + \frac{(1000 - 920)}{9}$$

$$\frac{(1000 + 920)}{2}$$

$$= 90 + \frac{8.88}{960}$$

$$= \frac{98.88}{960} = 0.103 \times 100$$

$$\boxed{AYTM = 10.3\%}$$

LR = 7% HR = 12%

Yr	Int	PV@7%	PV	PV@12%	PV
1	90	0.9345	84.10	0.8928	80.35
2	90	0.8734	78.36	0.7971	71.73
3	90	0.8162	73.45	0.7117	64.05
4	90	0.7629	68.65	0.6355	57.19
5	90	0.7129	64.16	0.5674	51.06
6	90	0.6663	59.96	0.5066	45.59
7	90	0.6227	56.04	0.4523	40.70
8	90	0.5820	52.38	0.4038	36.34
9	1090	0.5439	592.85	0.3606	393.05
				0.4038	
				0.3606	

PVLR = 1126.95 PVHR = 940.06

$$YTM = LR + \frac{PVLR - MP}{PVLR - PVHR} \times DR$$

$$= 7 + \frac{(1126.95 - 920)}{286.35} \times 5$$

$$= 7 + 0.722 \times 5$$

$$= 7 + 3.61$$

$$= 10.61$$

YTM = 10.61%

YTC sums 12 April.

Q) A Bond of Rs 1000 face value bearing coupon rate of 12% will mature in 7 yrs and company as call back the bond in 4 yrs calculate YTC.

Calculate $AYTM = \frac{I + (RV - SV)/n}{\left(\frac{RV + SV}{2}\right)}$.

$$AYTM = \frac{120 + (1000 - 1000)/7}{\frac{(1000 + 1000)}{2}}$$

$$AYTM = \frac{120}{1000} = 12\%$$

12 April

(YTC) (AYTM, YTC)

10%-LR

Yrs	int	PV@10% $\frac{1}{1.10}$	PV
1	120	0.909	109.08
2	120	0.8264	99.168
3	120	0.7513	90.156
4	120	0.683	764.96

PVLR = 1063.36

HR-14%

Yrs	int	PV@14% $\frac{1}{1.14}$	PV
1	120	0.877	105.24
2	120	0.769	92.28
3	120	0.674	80.88
4	120	0.592	663.0

PVHR = 941.6

LR = 10%

HR = 14%

Calculate YTC

PVLR - 1063.36 PVHR - 941.6)

$$YTC = \frac{10 + 1063.36 - 1000}{1063.36 - 941.6} \times 4 = LR + \frac{PVLR - M}{PVLR - PVHR} \times D$$

YTC = 12.09%

only adg the
Duration u should do

Macaly's Duration (MD) = $\frac{\Sigma NPV}{\Sigma PV}$

If YTM not given take cal YTM or get value.

1. Determine MD of a bond that has a face vale of Rs 1000 with 10% coupon rate and 3 yrs to mature. YTM is 12%.

yrs	int	PV @ 12% $\frac{1}{1.12}$	PV (int x PV)	W (take)
1	100	0.8928	89.28	1 yr.
2	100	0.7971	79.71	2
3	1100	0.7117	782.9	3
			ΣPV = 951.9	

WPV (WXPV)

(89.2 x 1) 89.28

(79.71 x 2) 1501.4

(782.9 x 3) 2349

ΣWPV = 2597

Macaly's Duration (MD) = $\frac{2597.21}{951.8}$ = 2.73 years

Modified Macaly's Duration (MMD) = $\frac{MD}{1 + \frac{YTM}{P}}$ = $\frac{2.7}{1 + \frac{0.12}{1}}$

P = no of time interest paid

= 2.41 yrs.

4/15/2021 Macaulay's Duration.

Yr's	Int	@ 6% $\frac{1}{1.06}$	PV	WPV
1	70	0.9433	66.031	66.031
2	70	0.8899	62.293	124.586
3	70	0.8396	58.772	176.316
4	1070	0.7920	847.44	3389.76
			1034.536	3756.693

$$MD = \frac{\Sigma WPV}{\Sigma PV} = \frac{3756.693}{1034.536} = 3.631 \text{ yrs}$$

Yr's	Int	PV @ 6%	PV	WPV
1	80	0.9433	75.464	75.464
2	80	0.8899	71.192	142.384
3	80	0.8396	67.168	201.504
4	1080	0.7920	855.36	3421.44
			1069.184	3840.792

$$MD = \frac{3840.792}{1069.184} = 3.592 \text{ yrs}$$

A

$$MMD = \frac{MD}{1 + \frac{YTM}{P}} = \frac{3.63}{1 + \frac{0.06}{1}} = 3.42$$

B

$$MMD = \frac{3.59}{1 + \frac{0.06}{1}} = 3.39 \text{ yrs}$$

(2) Arun buys a bond with 4yrs. Maturity. The bond has a coupon rate of 9% and face value of Rs 100 with YTM 12%. calculate MD, MMD. When the interest is paid semi annually.

Sol) No of yrs $= 4 \times 2 = 8$

YTM will be divided by 2

$Int = \frac{9}{2} = 4.5\%$

$YTM = \frac{12}{2} = 6\%$

Yrs	Int	PV @ 6% $\frac{1}{1.06}$	PV	WPV
1	4.5	0.9433	4.24485	4.24485
2	4.5	0.8899	4.00455	8.0091
3	4.5	0.8396	3.7782	11.3346
4	4.5	0.7920	3.564	14.256
5	4.5	0.7471	3.36195	16.8097
6	4.5	0.7049	3.1716	19.029
7	4.5	0.6649	2.99205	20.9444
8	4.5	0.6273	65.5725	524.58
			90.6703	619.05

$MD = \frac{\Sigma WPV}{\Sigma PV} = \frac{619.14}{90.68} = 6.82$

$MMD = \frac{6.82}{1 + \frac{0.12}{2}} = 6.43$

unit-III 16/04/2021

value of share (P0) = $\frac{D_1 + P_1}{1 + K_e}$

D_1 = Expected Dividend.

P_1 = Price at end.

K_e = cost of equity.

① If $D_1 = 3.5$ and $P_1 = 421$ with cost of equity is 20% calculate the price of share.

Sol) value of share (P_0) = $\frac{D_1 + P_1}{1 + K_e}$

$= 3 \frac{}{1+K_e}$

$= \frac{3.5 + 421}{1 + 0.20} = 203.75$

②

$P_0 = \frac{D_1 + P_1}{1 + K_e} = \frac{7 + 856}{1 + 0.15} = 310.43$

③ II Model Constant Growth rate.

value of share (P_0) = $\frac{D_1}{K_e - G_1}$

D_1 = Dividend at end

K_e = cost of capital

G_1 = Growth rate.

(3) $D_1 = D_0(1+g)$

Ans)

$D_1 = 3.5$

$G = 0.10$

$K_e = 0.15$

value of share $(P_0) = \frac{D_1}{K_e - g}$

$= \frac{3.5}{0.15 - 0.10}$ = ₹70/-

(2) the company ABC's Next year dividend per share is expected to be ₹ 3.5 the dividends will have growth rate of 10%.

(4) Ans) estimate that from investment in stock A he will get 15% dividends next year. It would continue to grow at 10%. the selling price of the share is 40 Rs. Required rate of return is 20%. calculate share price.

Ans) $D_1 = D_0(1+g)$

$= 40 \times 15\% = 6$

$G = 0.10$

$K_e = 0.20$

value of share $(P_0) = \frac{D_1}{K_e + G}$

$= \frac{6}{0.20 - 0.10}$ = 60.4

③ Antique Arts company wouldpay Rs 2.50 dividend per share next yr and expected growth is 12%, what would be the equity value of the $K_e = 20\%$.

Ans) $D_1 = 2.50$

$G = 0.12$

$K_e = 0.20$.

value of share $P_0 = \frac{D_1}{K_e - G} = \frac{2.5}{0.20 - 0.12}$

$= \frac{2.5}{0.07} =$

$= 31.25$.

19/04/2021

The visual computer corp has been experiencing an above normal growth rate of 25% for the post 5 yrs the above normal growth rate is expected to continue for another 5 yrs before it levels off at a rate of 7% forever. The last dividend paid by the company is Rs 1.20. Determine the current value of the stock of its rate of return is 20%.

Sol) growth

1-5 yrs = 25%

6 yrs - forever = 7%.

Q01) Growth:

1-5 yrs = 25%

6 yrs - forever = 7%

$D_0 = 1$

$K_e = 20\%$

$D_1 = D_0(1+g)$

1 yr = $1(1+0.25) = 1.25$

II yr = $1.25(1+0.25) = 1.56$

III yr = $1.56(1+0.25) = 1.95$

IV yr = $1.95(1+0.25) = 2.44$

V yr = $2.44(1+0.25) = 3.05$

Step 1

Yrs	D_1	PV@20% $\frac{1}{1.20}$	Present value
1	1.25	0.9333	1.04
2	1.56	0.6944	1.08
3	1.95	0.5787	1.12
4	2.44	0.4822	1.17
5	3.05	0.4018	1.22
		Total PV =	5.63

Step 2. Calculation of MP using Constant Growth Mode:

Value of share $P_0 = \frac{D_1}{K_e - G_1}$

$D_1 = D_0(1+G_1)$

$= 3.05(1+0.07) = 3.26$ //

$P_0 = \frac{3.26}{0.20 - 0.07} = 25.10$ //

step 3: calculation of PV of MP

Rs. 10 × 0.4018 (PV to last value)
= 10.04 we have to take

step 4: share value = 5.63 + 10.04 = 15.7
PV of 4 yr total + PV of 4 yr total

(5) for the first four yrs xyz firm is assumed to grow at a rate of 10%. After 4 yrs the growth rate is expected to be 8% from 7th yr onwards the firm's growth is 6% pa forever. The dividend paid by the company is Rs 2 last yr and required rate of return is 14%. Calculate price of the share.

sol) 1-4 yrs 10% Growth
5-6 - 8% Growth
7 yrs - 6% forever

step 1 yrs	D1	PV @ 14% $\frac{1}{1.14}$	PV
1	2.2	0.8771	1.92
2	2.42	0.769	1.86
3	2.66	0.675	1.76
4	2.92	0.592	1.73
5	3.16	0.519	1.64
6	3.41	0.456	1.55
		PV of D1	10.48

$D_1 = P_0(1+G)$

$D_1 = 2(1+0.10) = 2.2$

I $= 2.2(1+0.10) = 2.42$

II $= 2.42(1+0.10) = 2.66$

III $= 2.66(1+0.10) = 2.92$

IV $= 2.92(1+0.09) = 3.16$

V $= 3.16(1+0.09) = 3.41$

VI

step 2: calculation of MP using constant Growth model

$$P_0 = \frac{D_1}{K_e - G}$$

$D_1 = D_0(1+G)$

$= 3.41(1+0.06)$

$= 3.62$

value of share $[P_0] = \frac{3.62}{0.14 - 0.06}$

$= 45.25$ /-

step3: calculation of PV of MP

$45.25 \times 0.456 = 20.63$

step 4: value of share = First step + Third step.

$= 10.48 + 20.63$

$= 31.11$ /-