CA FINAL - AFM

Introduction - Basics

TVM

Valuation:-

₹100 Today ≠ ₹100 a year later

Money has a time value

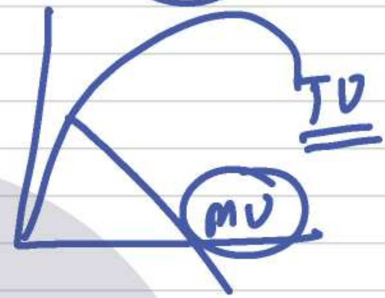
5% p.a.

1) Inflation — Minimum TVM

2) Returns — 3%

3) Risk Premium — 2%

DR.



Valuation

10% → DR

P_0 ⇒ COC → K_e, K_d, K_p, K_r — WACC

CAPM

K_e ⇒ R_F + Risk Premium = 0

Inflation + Return ⇒ FD Rate

4% + 3% = 7%

Inflation :- Actual

CPI → Consumer Price Index

WPI → Whole Sale Price Index

→ Commodities / Services

Basket → Index

100 → 105

$$\% \text{ Inflation} = \frac{105-100}{100} \times 100$$

$$= 5\% \checkmark$$

$\boxed{\text{Nifty / Sensex} \rightarrow \text{Index}}$

RBI → To Control the Inflation
→ To Decide ROI

Repo → Avenue   MMI

K_e = 15%
⇒ Cost of Equity
→ From Co.'s Point of View

E(R) ⇒ Expected Return of an Investor
15%

CAPM :-

100 cr Earn 11/12

1 → 100 cr

20% 13-14%

CAPM :- $K_e = ?$ | $E(R) = ?$

$E(R) \Rightarrow R_F + \text{Risk Premium}$

R_F → 8%

[Inflation + Return]

Risk Premium → β = Beta

Beta :- Sensitivity of Asset Return with the Mkt. Return in context with the Mkt. Return

Reliance / ITC / Infosys → Assets

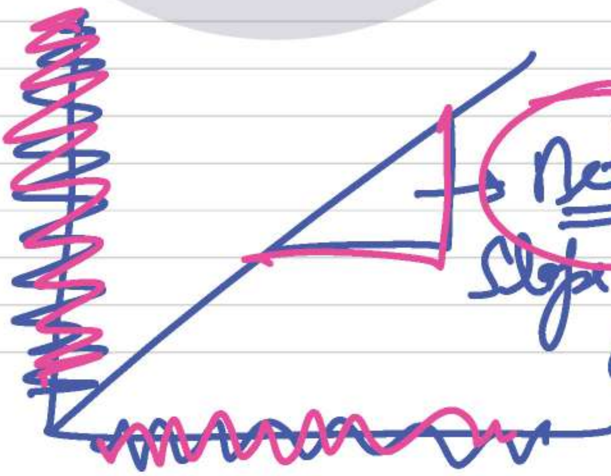
Mkt. → Nifty / Sensex

50 stocks proxies to the Mkt.

Nifty

Asset

Beta.



→ Beta

Slope of the line

How :- Mkt · Return

$$\boxed{\text{Beta} \Rightarrow \frac{\text{change in Security Return}}{\text{change in Mkt · Return}}}$$

Base → Mkt · ⇒ $\beta_m = 1$

↳ Benchmark

$\beta_m = 1$ → 2 .50

10% ↑ → 20% 5% ↑

$$= \frac{5\%}{2\%} \qquad \frac{15\% \; (-) \; 10\%}{7\% - 5\%}$$

= 2.5 times

$\boxed{\beta = \text{times}}$

$$\boxed{\text{CAPM} \Rightarrow R_F + (R_m - R_F)\beta}$$

1.1

.50

$R_m - R_F \Rightarrow$ Mkt. Risk Premium / Security Risk Premium

$\beta \Rightarrow$ Sensitivity / Risk Index

$$\boxed{E(R) \Rightarrow R_F + \beta_s [R_m - R_F]}$$

$\beta_m = 1$ ✓

$\beta = 1$ $\boxed{E(R) = R_m}$

$\boxed{\beta = 0 \quad E(R) \Rightarrow R_F}$

$$E(R) = R_F + \beta = 1\,[R_m - R_F]$$

$$\boxed{E(R) = \cancel{R_F} + R_m - \cancel{R_F}}$$

$$\boxed{E(R) = R_m}$$ Answer Proved

2) Fisher's Effect :- (Irvin Fisher)

⇒ $$\boxed{MR = RR + \text{Inflation Rate}}$$

MR ⇓ It includes inflation

RR ⇓ It excludes inflation

Risk Premium:

Bank FD | Corporate FD

7% → 10.5%

R_F Security | Default Risk

Risk = 0

Valuation ~~~~~~~~ Different

3) RADR :- Risk Adjusted Discount Rate

$$\boxed{RADR = R_F + \text{Risk Premium}}$$

MR = RR + IR

Compounded:-

10%

Ren = 10

$\Rightarrow$ (1+MR) = (1+RR) (1+Inflation Rate)

$\Rightarrow$ (1+RADR) = (1+RFR) (1+RP)

IFM / Advanced CB

Risk Premium:-

DR $\Rightarrow$ Risk

1) Default Risk :- Co $\rightarrow$ Default

$\rightarrow$ Intt.

$\rightarrow$ Principle

⇒ Credit Rating.

↳ Prob. of Default

2) Liquidity Risk:-

Easily tradeable

ETF's

Stocks ⇒

MF's

Highly liq.

Z → 2|1

3) Maturity Risk:- (Bonds)

20 year T-Bond LTD

1 year T-Bill Short-term

MCQ.

TVM

FV Technique.

PV Technique

F/O

1) FV of Single CF :-

$r = 10\%$ p.a.

1,00,000

$t = 1$ year.

FV = ?

$\Rightarrow 1,00,000\,(1+.10)^{1} = 1,10,000$

Interest on Interest

If $t = 3$ years

$r = 10\%$ p.a.

1,00,000 — $t = 3$ yrs — FV = ?

$$FV = 1,00,000\,(1 + .10)^3$$

$$\Rightarrow \underline{133100}$$

$$\boxed{FV = PV\,(1+r)^n}$$

$$[1,00,000 + 1,00,000 \times 10\%] + 10\%$$

Example.

11% | 12% | 13%

1,00,000 — FV = ?

$1,00,000 (1+.11)(1+.12)(1+.13)$

$\Rightarrow$ ₹ 140481.60

Example:- If time period is less than 1 year:-

MMI → CD's | CP's | T-Bill

$r = 10\%$ p.a.

$t = 90$ Days

1,00,000

FV = ?

$\Rightarrow 1,00,000 \left(1 + .10 \times \frac{90}{365}\right)$

FV $\Rightarrow$ ₹ 102493.15

Example. (FtO) Derivatives :-

$r = 10\%$ p.a.

10,000 —— $t = 6$ mths —— FV = ?

Interest is compounded monthly

Compounding :-

⇓

Normal (NC) → Concept of $(1+r)^n$ ⇓

Continuous (CC) ⇓ Concept of e^{rt}

Real-time compounding ⇓

Concept of EAR

Cal. of FV using EAR

[Derivatives]

1) EAR :- Effective Annual rate

FD → ROI = 10% p.a.

FD → Monthly

EAR ⇒ more than 10%

$$\boxed{EAR = (1 + \text{Periodic Rate})^{m} - 1}$$

Periodic rate ⇒ $\frac{\text{Annual rate}}{m}$

m = No. of Compounding period p.a.

$$\left(1+\frac{.10}{12}\right)^{12} - 1$$

$$\boxed{EAR \Rightarrow 10.47\% \text{ p.a.}}$$

EAR → ROI actually realized due to Compounding.

Cal. FV:-

$r = 10\%$ p.a

10,000 — $t = 6$ mth — FV = ?

Int is compounded monthly.

$$\boxed{FV = PV\left(1+\frac{r}{m}\right)^{m \times n}}$$

$$\Rightarrow 10{,}000\left(1+\frac{.10}{12}\right)^{\cancel{12}\times\frac{6}{\cancel{12}}}$$

$$\Rightarrow ₹\ \underline{\underline{10510.53}}$$

2) Present Value of Single CF :-

$r = 10\%$ p.a.

$t = 1$ yr.

PV = ?

10,000

$$FV = PV(1+r)^n$$

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

$$\Rightarrow \frac{10,000}{(1+.10)^1} \Rightarrow ₹\ 9090.91$$

$$1/(1+.10)^1 \Rightarrow \text{PVF}$$

Example. $t = 4$ years

PVF

$$\frac{10,000}{(1+.10)^4} \Rightarrow 10,000 \times .683$$

$$\Rightarrow ₹\ 6830$$

$$\boxed{10,000 \times \text{PVF} @ 10\%, 4^{th} \text{ year}}$$

3) Future Value of Multiple CF's :-

(MIRR)

Example

$r = 10\%$ p.a.

4 3 2 1

5000 2000 2500 1500 600 FV = ?

$5000(1+.10)^4 \Rightarrow 7320.50$

$2000(1+.10)^3 \Rightarrow 2662$

$2500(1+.10)^2 \Rightarrow 3025$

$1500(1+.10)^1 \Rightarrow 1650$

$600(1+.10)^0 \Rightarrow 600$

$\Sigma \Rightarrow FV \Rightarrow ₹\ 15257.50$

4) Present Value of Multiple CF's :-

$r = 10\%$

PV = ?   1200   1500   5000   6000

	1	2	3	4
	1200	1500	5000	6000

$$\frac{1200}{(1+.10)^1} + \frac{1500}{(1+.10)^2} + \frac{5000}{(1+.10)^3} + \frac{6000}{(1+.10)}$$

1.10 ÷ = × 1200 M+

1.10 ÷ = = × 1500 M+

1.10 ÷ = = = × 5000 M+

1.10 ÷ = = = = × 6000 M+

PV ⇒ MRC

10185.233

5) Annuity

⇓

Deferred Annuity | Annuity Due

1) Deffered :-

n = 4 years

	1	2	3	4
	1000	1000	1000	1000

PV = ?

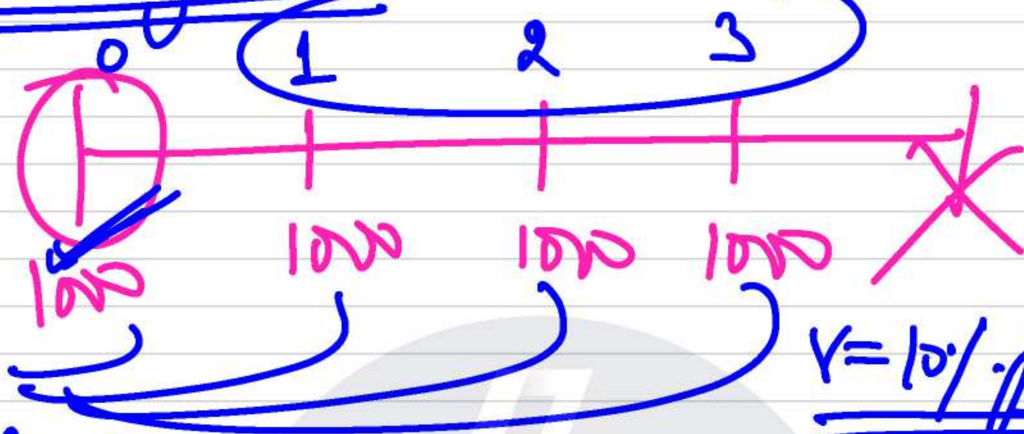
r = 10% p.a.

ST

1000 [PVAF @ 10%, 4 years]

→ 1000 × 3.17 → 3170

Annuity Due:-



$r = 10\%$ p.a.

PV = ?

$(n-1)$

$1000\left[1 + PVAF\ @\ r\%\ (n-1)\ \text{years}\right]$

$\Rightarrow 1000\left[1 + PVAF\ @\ 10\%,\ 3\ \text{years}\right]$

$\Rightarrow 1000\left[1 + 2.487\right]$

$= \underline{3487}$ ✓

7) Equal CF's upto Perpetuity:-

(Annuity upto Perpetuity)

Example

$$\frac{100}{(1+r)^1} \quad \frac{100}{(1+r)^2} \quad \frac{100}{(1+r)^3} \quad \frac{100}{(1+r)^4} \quad \cdots \infty$$

a

Sum of Infinite series of GP

Derivation [Not relevant for exams]

$$CR = \frac{\cancel{100}/(1+r)^{\cancel{2}}}{\cancel{100}/(1+r)^{\cancel{1}}} \Rightarrow \frac{1}{1+r} = CR$$

Sum of Infinite series of GP:-

$$= \frac{a}{1-r} = \frac{FT}{1-CR}$$

$$\Rightarrow \frac{\frac{100}{1+r}}{1-\frac{1}{1+r}} \Rightarrow \frac{\frac{100}{\cancel{1+r}}}{\frac{\cancel{1}+r-\cancel{1}}{\cancel{1+r}}}$$

$$\Rightarrow \frac{100}{r} \quad \text{or} \quad \boxed{\frac{\text{Equal CF's}}{\text{Discount rate}}}$$

$\frac{\text{Int.}}{100}$ ———— ∞

$\underline{\text{Dv}}$ 1000 ———— ∞

CF ———— ∞

$$\boxed{PV \Rightarrow \frac{CF}{DR}}$$

10 ———— ∞ $\quad \frac{10}{K_d}$

100 ———— ∞ $\quad \frac{100}{K_e}$

1000 ———— ∞ $\quad \frac{1000}{K_d}$

8) Growing Perpetuity:- Gordon's

CF1

100

$$\frac{100(1+g)^1}{(1+r)^1} \quad \frac{100(1+g)^2}{(1+r)^2} \quad \frac{100(1+g)^3}{(1+r)^3}$$

$$\boxed{CR = \frac{1+g}{1+r}}$$

Sum of infinite series of GP

$$\boxed{\frac{FT}{1-CR}}$$

$$\frac{\frac{1000(1+g)}{1+r}}{1-\frac{1+g}{1+r}} \Rightarrow \frac{\frac{1000(1+g)}{\cancel{1+r}}}{\frac{\cancel{1}+r-\cancel{1}-g}{\cancel{1+r}}}$$

$$\Rightarrow \frac{CF_0(1+g)}{r-g} \text{ or } \frac{CF_{\text{at the Begin}}(1+g_s)}{DR - \text{growth rate}_c}$$

$$\boxed{\frac{CF_{1\,\cancel{st}}}{DR-g_c}} = PV$$

$CF_1 \rightarrow$ CF at the end of 1st year