

FINAL TERM

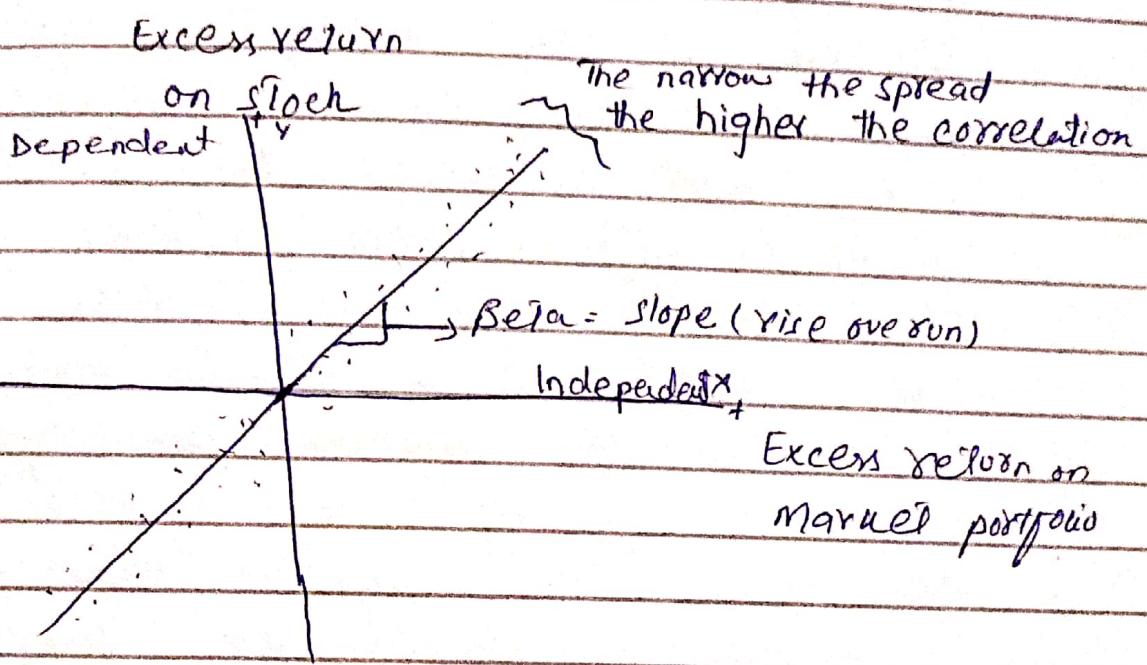
Chapter : 05

Risk and Return

Capital Asset Pricing Model.

by sharpe (1960)

Characteristics line.



Excess Return (R_i) $\text{Beta} > 1$ (aggressive)

Beta = 1

Beta = 1 (defensive)

Excess return M (R_M)

CapM:

A model that is priced describes the relationship between risk and return. The securities expected return is the risk free plus a premium based on the systematic risk of the security.

- Few of the assumptions of the model are,
- 1. We assume that capital markets are efficient in which the investors are well informed, transactions cost are low, there are negligible restrictions on investment and no investor shall influence the market price of a stock.
 - 2. We assume that investors are in general agreement about the smooth performance of the individual securities and their expectations are based on common holding period.
 - 3. There are two types of Investment Opportunities.
the first is a risk free security whose return over the holding period is known with certainty. - Market portfolio of common stocks. It is represented by all available common stocks and weighted according to their total aggregated

market value accordingly.

Characteristics line:

A line that describes the relationship between an individual security returns and returns on the market portfolio.

The slope of this line is Beta.

Beta:

An index of systematic risk it measures the sensitivity of a stock returns to changes in returns on the market portfolio. It is the weighted average of the individual stock betas in the portfolio.

The greater the beta of stock, the greater the relevant risk of the stock.

Represented as,

$$R_j = R_f + \beta_j (R_m - R_f)$$

A security market line describes the linear relationship between expected rates of returns for individual securities and systematic risk as measured by Beta.

Self-correction ①.02

payback period, the proposal is accepted.
 If not, it is rejected. In this case
 if the required PBP was 3 years
 the project would be accepted

2 Interest Rate of Return: (Hurdle Rate)

The discount rate that equals the present value expected cash flows with the initial investment

$$\$100,000 = \frac{34,432}{(1+R)^1} + \frac{39,530}{(1+R)^2} + \frac{39,589}{(1+R)^3} + \frac{32,219}{(1+R)^4}$$

$$PV_{L, 15\%} = \frac{34,432}{(1+15)^1} + \frac{39,530}{(1.15)^2} + \frac{39,589}{(1.15)^3} + \frac{32,219}{(1.15)^4}$$

$$PV_{H, 20\%} = \frac{34,432}{(1.20)^1} + \frac{39,530}{(1.20)^2} + \frac{39,539}{(1.20)^3} + \frac{32,219}{(1.20)^4}$$

$$\text{Interpolated IRR} = i_L + \frac{(i_H - i_L)(PV_L - PV_H)}{PV_L - PV_H}$$

$$0.15 + \frac{(0.20 - 0.15)(104968.10 - 100,000)}{104968.10 - 94434.10} = -254.00\%$$

$$0.15 + \frac{(0.05)(104968.1)}{9734} = \frac{208.405}{0.0214} = 0.1774$$

There are four types of budgeting techniques.

Case:

Consider a facility with an initial cash outflow (investment) of \$100,000. The expected cash inflows for next 4 years are \$34,432, \$39,530, \$39,359 and \$32,219

1- Payback period:

The period of time required for the cumulative expected cash flows from an investment projects equals to initial investments

PBP

Years	Cashflows (100,000) ^b	Cumulative Cashflows
0		-
1	34,432	34,432
2	39,530	73,962 ^c
3	39,359 ^d	113,321
4	32,219	145,540

$$\text{PBP} = a + \frac{b-c}{d} = 2 + \frac{100,000 - 73,962}{39,359}$$
$$= 2.661 \text{ years.}$$

Acceptance Criteria:

If the payback period calculated is less than some maximum acceptable

Dependency and Mutual Exclusive projects:

Independent projects:

A project whose acceptance (or rejection) does not prevent the acceptance of other projects under consideration.

Dependent (or contingent) project:

A project whose acceptance depends on the acceptance of one or more other projects.

Mutually Exclusive projects:

A project whose acceptance precludes the acceptance of one or more alternative projects.

Ranking Problems:

It is based on three project differences:

- (1)- Scale of Investment:- Costs of projects differ
- (2)- Cash flow pattern &- Timing of cash flow differs
for example, cash flow of one project increases over time whereas those of another decrease.
- (3)- Project life:- Projects have unequal lives.

Acceptance Criteria:

The minimum required Rate of Return that is the internal Rate of return if exceeds the required rate of return, the project is acceptable

For example:

if required rate of return is 12%, then internal rate of return of 17.15% is acceptable.

3. Net Present Value:

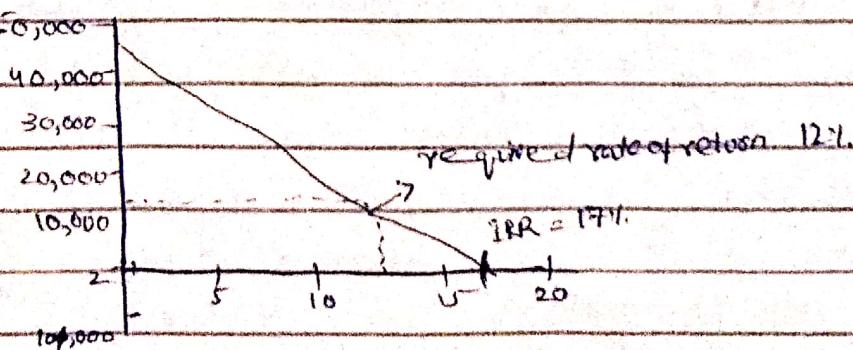
The present value of the expected cash flows which shows the recovery of the initial investment. The NPV is greater than 0.

$$NPV = \left\{ \frac{\$34,432}{(1.12)^1} + \frac{39,530}{(1.12)^2} + \frac{39,359}{(1.12)^3} + \frac{32,211}{(1.12)^4} \right\} - \$100,000$$

$$= \$110,746.64$$

$$\begin{aligned} NPV &= \$110,746.64 - \$100,000 \\ &= \$10,746 \end{aligned}$$

NPV Profile



for required rates greater than the internal rate of return, the project is rejected under either method that is NPV or IRR. Does the internal rate of return and NPV methods give us identical answers with respect to the acceptance or rejection of an investment project.

Profitability Index:

It is a relative measure of profitability in relation to the investment project. The value greater than 1 is acceptable.

$$PI = \left\{ \frac{80742.65}{(1.12)^1} + \frac{31513.07}{(1.12)^2} + \frac{34,432}{(1.12)^3} + \frac{39,530}{(1.12)^4} + \frac{39,359}{(1.12)^5} + \frac{132,219}{(1.12)^6} \right\} / \$100,000$$

$$PI = 1.1074 \quad \text{Ans}$$

NPV is a superior value method. The net present value is a superior measure among the techniques specially profitability index because it is expressed in absolute dollar that indicates the accurate economic contribution that the project makes to shareholder wealth.

Chap # 06

Financial Statement Analysis:

1- Balance Sheet Ratios

2- Income Statement / Income Statement and Balance Sheet Ratios

⇒ Financial Statement Analysis comprises off financial ratios which is an index that relates two accounting numbers and is obtained by dividing 1 number by the other.

There are two kinds of financial ratios.

The first ratio is Balance sheet Ratio, These ratios summarizes the financial condition of the company at a certain point of time, Normally annually. Both the numerator and denominator comes from the balance sheet items which truly depicts the financial historical but today's annual financial performance of it in the industry.

The second kind is Income statement ratios. These ratios assess the financial performance of the company with accuracy in real terms by encompassing the items from either the income statement or from both income statement or balance sheet.

7-Dec

1. Scale Difference:-

End of Year	Net Cash Flows	
	Project S	Project L
0	(\$100)	(\$100,000)
1	0	0
2	400	156,250

Based on the information - NPV at 10%.

PI at 10%

Project S IRR 100%

\$231

3.31

Project L IRR 25%

\$29,132

1.29

Ranking the projects IRR

NPV at 10%

PI at 10%

1st place Project S

L

S

2nd place Project L

S

L

→ Interpretation:

Project S preferred over project L on the basis of IRR and PI whereas project L is preferable based on NPV value which clearly creates a conflict about the selection of projects. Therefore depending upon the situational circumstances as well as

the financial condition of the company it shall decide which project to pursue

2- Difference In cash-flow Patterns:-

End of year	Project D (1200)	Project I (1200)
0		
1	1,000	100
2	500	600
3	100	1080

The cash flow patterns are different. Project D's cash flows decrease over time, whereas project I's cash flows increase.

IRR of D and I are 23% and 17%. respectively for every discount rate $> 10\%$, project D's NPV and PI will be larger than project I and vice versa. If we assume a required rate of return of 10%, the NPV and PI of each project is 198 and PI of 1.17

Ranking - $K < 10\%$ IRR $K \geq 10\%$

Ranking	NPV	PI	NPV	PI
1st Rank Project	II	D	D	D
2nd Rank Project	DD	I	P	I

Project D

$$k < 10\% = \frac{100}{(1.08)^1} + \frac{500}{(1.08)^2} + \frac{100}{(1.08)^3} = ? - 1200$$

Project E

$$= \frac{1000}{(1.08)^1} + \frac{600}{(1.08)^2} + \frac{1080}{(1.08)^3} = ? - 1200$$

$k > 10\%$

Project D = $\frac{1000}{(1.12)^1} + \frac{500}{(1.12)^2} + \frac{100}{(1.12)^3} = ? - 1200$

E = $\frac{100}{(1.12)^1} + \frac{600}{(1.12)^2} + \frac{1080}{(1.12)^3} = ? - 1200$

3- Difference in Project lives.

Consider two investment Projects:

End of Year	NET cash flows	
0	Project X	Project Y
1	(1,000)	2,000
2	0	0
3	3,375	0

The IRR for X and Y is 50% and 100%.

If required rate is 10%, the NPV is \$1536 and its PI is 2.54. For Y, NPV is \$818 and PI is 2.82

IRR	NPV at 10%	PI at 10%
50%	\$1,536	2.54
100%	818	1.82

Ranking	IRR	NPV at 10%	PI at 10%
1st Rank Project	Y	X	X
2nd Rank Project	X	Y	Y

We assume that short lived projects are reinvested at 10%.

NET cash flow at end of year

Project X	(1,000)	0	0	3,375	NPV at 10%
Project Y	(1,000)	2,000	0	0	\$1,836
If Project Y's cash flows are reinvested at 10%	(1,000)	0	0	2,420	\$818

Compounded 2 years

The higher is the turnover, the shorter is the time period between the typical sale and cash collection.

The receivable turnover in days tells us the average number of days for which receivables are outstanding before being collected. If the average medium of the industry is less than 62 days then this is alarming for the company that their firm's account receivables are recovered late as compared to the rest of the other firms operating in the industry.

Inventory Activity:-

$$\frac{\text{Cost of Good sold}}{\text{Inventory}} = \frac{2680}{1329} = 2.02$$

Inventory turnover in Days

$$\frac{\text{Days in year}}{\text{Inventory turnover}} = \frac{365}{2.02} = 181 \text{ days}$$

There are 5 categories of financial Ratios

- ① Liquidity ratios
- ② Debt / leverage ratios
- ③ Coverage ratios / Activity Ratios
- ④ Profitability
- ⑤ Market value Ratios

1- Liquidity Ratios:

These ratios measure a firms ability to meet short term obligations. The liquidity ratios include current ratios and acid test ratios

a- Current Ratios:

The current ratio shows the firms ability to cover its current liabilities with its current assets = $\frac{\text{Current Assets}}{\text{Current Liabilities}} = \frac{2,241}{823} = 2.72$

ratio of 2.72 indicates the good liquid condition of company to repay its liability.

b- Acid test (Quick) Ratios:

Acid test ratio shows the firms ability to meet current liabilities with its most liquid assets. The ratio of $\frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}} = \frac{2,241 - 1329}{823} = 1.11$ indicates that the current asset position of a company is good enough after excluding inventories, that it has enough money to recover its liability.

Financial Statement Analysis

(3) Coverage Ratios (Interest Coverage Ratios):

The ratios that relate the financial charges of a firm's ability to cover them. The interest coverage ratio indicates the firm's ability to cover interest charges. It is also called times interest earned.

The value of 4.71 is a good ratio indicating the company's ability to cover its interest paid without difficulties.

$$\frac{\text{Earnings before Interest and Tax}}{\text{Interest Expense}} = \frac{400}{85} = 4.71$$

Activity Ratios: The ratios that measure how effectively the firm is using its assets. The following are the activity ratios (1) Receivables activity Ratio.

(1) Receivables Activity: Receivable turn over ratio provides insight into the quality of the firm's receivables and how successful the firm is in its recovery.

The value of 5.89 indicates the no. of times accounts receivable have been turned over into cash during the year.

$$\frac{\text{Net Sales}}{\text{Accounts Receivable}} = \frac{3992}{678} = 5.89$$

(2) Receivable turnovers in days:

$$\frac{\text{Days in year}}{\text{Receivable turnover}} = \frac{365}{5.89} = 62 \text{ days.}$$

Financial Management

-> Activity Ratio:

3- **Total Asset turnover Ratio:** is also called the capital turnover ratio, it indicates the revenue per dollar of investment of Assets on Average, this ratio indicates the relevant efficiency with which a firm utilises its total assets to generate sales. The value of 1.23 indicates

$$\frac{\text{Net Sales}}{\text{Total Assets}} = \frac{3992}{3250} = 1.23$$

the amount of total assets invested to generate sales.

4- **Profitability Ratios:** that relate profit to sales and investment. It is of two broad categories 1- Profitability in relation to sales is also called gross profit Margin

* Profitability in Relation to sales:

$$\text{- Gross Profit margin} = \frac{\text{Net sales} - \text{CGS}}{\text{Net sales}} = \frac{3992 - 2680}{3992} = 32.9\%$$

This ratio tells us the profit of the firm relative to sales after deducting the cost. It measures the efficiency of the firms operations as about how the products are priced. It can be calculated by gross profit and Net profit Margin

$$\text{- Net Profit Margin} = \frac{\text{Net profit after taxes}}{\text{Net Sales}} = \frac{201}{3992} = 5.04\%$$

Measures the firm profitability of sales after taking account of all expenses and income taxes.

5) Market Value Ratio:

The company has 33 million shares outstanding and the stock sold for \$88 per share at the end of the year. The company's net income is \$363 million, the earnings per share.

$$\text{EPS} = \frac{\text{Net Income}}{\text{Shares outstanding}} = \frac{\$363}{33} = \$11$$

• Price-to-Earnings Ratio:

$$= \frac{\text{Price per share}}{\text{Earnings per share}} = \frac{\$88}{\$11} = 8 \text{ times}$$

The ratio indicates the company's shares sell for 8 times earnings.

The sales of the company are \$2311 and the book value of the company is \$2,591.

• Price-Sales Ratio:

$$\frac{\text{Price Per Share}}{\text{Sales Per Share}} = \frac{\$88}{\$2,311/33} = \frac{\$88}{\$70} = 1.26$$

This Ratio is high or low depending on the industry involved.

• Market-to-Book Ratio:

$$\frac{\text{Market value Per share}}{\text{Book value per share}} = \frac{\$88}{\$2,591/33} = \frac{\$88}{\$78.5} = 1.12 \text{ times}$$

A value less than one mean that the firm has not being successful in creating value for its stockholders.

Market value ratios are the following. These ratios are normally not necessarily contained in financial statement.
Price to - earning Ratio.

• Capitalization Ratios: It deals with the importance of long term debt to the capital structure of the firm.

$$\frac{\text{long term Debt}}{\text{Total Capitalization}} = \frac{631}{2427} =$$

\downarrow
(long term Debt
+ s-holder equity)

It indicates the firm's net income per dollar of sales.

* Profitability in Relation to Investment. Return on Investment / Return on Assets:

$$\text{Net Profit after taxes} = \frac{201}{\text{Total Assets}} = 6.18\%$$

It is also called return on assets or return on investment. This ratio depicts the employment of assets to generate a dollar of sales.

Return on Equity:

$$\text{Net Profit after taxes} = \frac{201}{\text{Shareholder equity}} = 11.96\%$$

This ratio measures the earning power on shareholder's book value investment used in comparing two or more firms in industry. A high return on equity reflects the firm's acceptance of strong investment opportunities and effective expense management.

(Now for American chemical company Identity to calculate ROE)

$$\text{ROE} = \text{Earning power} = \text{Sales Profitability} \times \text{Asset Efficiency}$$
$$\text{ROE} = \text{Net Profit Margin} \times \text{Total Asset Turnover}$$
$$= \underline{\underline{\text{S.P.M.}}} \times \underline{\underline{\text{T.A.T.}}}$$

Financial Management

Chap: 13

Capital Budgeting and its Techniques

Four Techniques of Capital budgeting.

- 1- Payback Period.
- 2- Internal Rate of Return
- 3- Net present value
- 4- Profitability Index

Capital Budgeting:

It is a process of identifying, analyzing and selecting investment projects whose returns that is cashflows are expected to cover the initial investment and which extends beyond one year. The projects could be classified into five categories:-

- 1- New product development or expansion of existing products.
- 2- Replacement of equipment or innovation of buildings
- 3- Research and development
- 4- Exploration.
- 5- Any other CSR activity.

$$\text{ROE} = \text{Net profit Margin} \times \text{Total Asset turnover} \times \text{Equity multiple}$$

$$= 5.04\% \times 1.23 \times 1.81 \downarrow$$

$$= 11.96\% \quad \text{11 P/E Ratio}$$

Leverage (Debt) Ratios: Debt ratios show the extend to which the firms is financed by debt. Following are the debt ratios:

- 1) Debt-to-equity Ratio
- 2) Debt-to-Total Asset Ratio
- 3) Capitalization Ratio.

Debt - to - Equity Ratio:

The debt-to-equity ratio indicates that creditors are providing 81 cents against one dollar which is provided by the shareholders. Creditors generally like this ratio to be less than 1, because they look and the opportunity of $\frac{\text{Total Debt}}{\text{Shareholder's Equity}} = \frac{1456}{1796} = 0.81 \rightarrow 1 + 0.81 = 1.81$ the repayment of loan back to the shareholders.

→ **Debt-to-Total Assets Ratio:** It highlights the relative importance of debt financing. The ratio of 0.45 indicates 45% of the firm's assets are financed with debt and the remaining 55% of the financing comes from shareholders' equity.

$$\frac{\text{Total Debt}}{\text{Total Assets}} = \frac{1454}{3250} = 0.45$$

Chap: 09

Cash and Marketable Securities

⇒ Motives for Holding Cash:

- 1- Transactions Motives
- 2- Speculative Motives
- 3- Precautionary Motives

There are three categories to describe the motive for corporations to hold cash. 1) Transactions motives: to meet form of purchases, wages, taxes and dividends arising in the ordinary course of business. 2) Speculative Motives: to take advantage of temporary opportunities such as a sudden decline in the price of a raw material. 3) Precautionary Motives: to maintain a safety cushion to meet unexpected cash needs.