

WORKING CAPITAL MANAGEMENT

What is working capital management?

- Working capital management refers to a company's managerial accounting strategy.
- Designed to monitor components of working capital, current assets (CA) and current liabilities (CL).
- Purpose: Company will have enough cash to cover current expenses and debt obligations, minimizing the cost of capital spent on working capital, and maximizing the return on current asset investments.
- Efficient working capital management helps to maintain the smooth operation of net operating cycle, also known as the cash conversion cycle (CCC).

Types of working capital ratios

Working capital ratio:

- Also known current ratio (CR)
- $CR = CA/CL$
- Key indicator of a company's ability to successfully meet all of its short term financial obligations.
- (i) $WC < 1$; (ii) $1.2 < WC < 2.0$ (iii) $WC > 2.0$

Collection ratio:

- Also known as average collection period ratio
- (i) How efficiently a company manages its accounts receivables.
(ii) Provides avg no. of days it takes a company to receive payment after a sale transaction on credit.
- $\text{Collection ratio} = \text{Product of no. of days in an accounting period} * (\text{avg amount of o/s receivables} / \text{total amount of net credit sales})$.
- Lower company's collection ratio = more efficient its cash flow

Inventory turnover ratio:

- Balancing inventory on hand with customer's needs while avoiding unnecessary inventory that ties up working capital for a long period before it is converted into cash.
- $\text{Inventory turnover ratio} = \frac{\text{Revenues}}{\text{Inventory cost}}$
- (i) Low ratio compared to industry = inventory levels are high
(ii) High ratio compared to industry = inadequate inventory levels

Why working capital management matters?

- Serves as a metric for how efficiently a company is operating and how financially stable it is in the short term.
- Indicates whether the company has adequate cash flow over short term debts and expenses.

Two concepts of Working capital:

- Gross Working Capital
- Net Working Capital

Importance of working capital management

- Improve company's earnings and profitability.
- Maintaining working capital operating cycle, ensuring its ordered operation, minimizing cost of capital spent on WC, maximizing the return on current investments.
- By using key performance ratios, helps to identify areas that require focus in order to maintain liquidity and profitability.

Indicative list of current assets and current liabilities

Current assets:

- Inventories
- Raw materials and packing materials
- Work-in-progress
- Finished/traded goods
- Stores, Spares and goods
- Sundry debtors
- Cash and bank balances
- Loans and advances
- Deposits
- Balances with government

Current liabilities:

- Sundry creditors
- Unclaimed dividend warrants
- Unclaimed debenture interest warrants
- Short term loans
- Cash credit from banks
- Other short term payables

Practice Example 1

Estimation of Working Capital Requirement:

Example:

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XYZ Ltd. sells its products on a gross profit margin of 20% on sales. It provides the following information:

Particulars	Amount in INR
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Sales (3 Months Credit)	4000000
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Raw Materials	1200000
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Wages (15 Days in arrears)	960000
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Manufacturing Expenses (One Month in arrears)	1200000
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Administration Expenses (One Month in Arrears)	480000
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Sales Promotion Expenses (Payable half yearly in advance)	200000
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The company enjoys one month's credit from suppliers of raw material and maintains 2 months stock of raw materials and one and half months finished goods. Cash balance is maintained at INR 100000 as a precautionary balance. Assuming 10% margin, calculate the working capital requirements of XYZ Ltd. Cost of sales for computation of debtors and stock of finished goods may be taken at sales minus gross profit as per rate of Gross Profit give.

Solution:**Statement of Working Capital Requirement**

Particulars	Amount in INR	Amount in INR
Current Assets:		
Raw Materials ($1200000 \times 2/12$)		200000
Finished Goods ($4000000 \times (80/100) \times (3/2) \times (1/12)$)		400000
Debtors ($4000000 \times (80/100) \times (3/12)$)		800000
Advance Payment of Sales Promotion Expenses ($200000 \times 6/12$)		100000
Cash Balance		100000
Total Current Assets		1600000

Less: Current Liabilities		
Creditors (1200000 X 1/12)	100000	
Outstanding Wages (960000 X 1/24)	40000	
Outstanding manufacturing Expenses (1200000 X 1/12)	100000	
Outstanding Administration Expenses (480000 X 1/12)	40000	
Total of Current Liabilities	280000	
Net Working Capital		1320000
Add: 10% Margin for contingencies		132000
Total Working Capital Required		1452000

Factors effecting working capital requirements

1. Nature of business
2. Length of period of manufacture
3. Volume of business
4. The proportion of the cost of raw materials to the total cost
5. Use of manual labour or mechanisation
6. Need to keep large stocks of raw materials of finished goods
7. Turnover of working capital
8. Terms of credit
9. Seasonal variations
10. Requirements of cash
11. Other factors –
 - a) Degree of co-ordination between production and distribution policies
 - b) Specialisation in the field of distribution
 - c) Developments of means of transportation and communications
 - d) The hazards and contingencies inherent in the type of business

Working capital cycle across industries

Industry	Receivable (in days)	Inventory (in days)	Working cycle (in days)	Payable (in days)	Net working cycle (in days)
Aviation	44	105	149	97	52
Cement	17	49	66	48	18
Real Estate	127	603	730	138	592
Gems & Jewellery	79	53	132	76	56
Engineering	97	40	137	72	65
IT	77	5	82	39	43
Metals	51	36	87	9	78
Mining	28	33	61	78	-17
Oil & gas	26	24	50	65	-15
Petrochemicals	35	33	68	67	1
Power	82	22	104	77	27
Refineries	11	39	50	40	10
Sugar	17	124	141	84	57
Tea/Coffee	26	57	83	54	29
Textile	51	79	130	37	93
FMCG	18	46	64	76	-12

Sources of working capital finance

1. Indigenous bankers
2. Trade credit
3. Installment credit
4. Advances
5. Factoring or accounts receivable credit
6. Accrued expenses
7. Deferred incomes
8. Commercial paper
9. Working capital finance by commercial banks
 - Loans
 - Cash credits
 - Overdrafts
 - Purchasing and discounting of bills
10. Letter of credit (LC) : (i) Clean LC; (ii) Documentary LC; (iii) Revocable LC; (iv) Irrevocable LC; (v) Revolving LC; (vi) Fixed LC

****Security required in bank finance: (a) Hypothecation; (b) Pledge; (c) Mortgage**

****Security required in bank finance:**

- **(a) Hypothecation;**(case)
- **(b) Pledge;** (Right of lien)
- **(c) Mortgage**(addl security)

➤ **Approaches to Working Capital Management:**

- a) Aggressive Approach**
- b) Conservative Approach**
- c) Matching Approach.**

Cash Management

Cash management

- Factors of cash management

- **Strategies of cash management**

- Cash planning
- Managing cash flows
- Optimum cash level
- Investing idle cash

- **Motives of holding cash**

- Transaction motive
- Precautionary motive
- Speculative motive

- **Level of cash balance**

- Compensating balances
 - Absolute minimum
 - Minimum average balance
- Self-imposed balance

Cash Management Models

William J Baumol's Model

➤ $C = \sqrt{(2A \times F)/O}$

- Where, C= Optimum cash balance
A = Annual cash disbursements
F = Fixed cost per transaction
O = Opportunity cost or holding cash

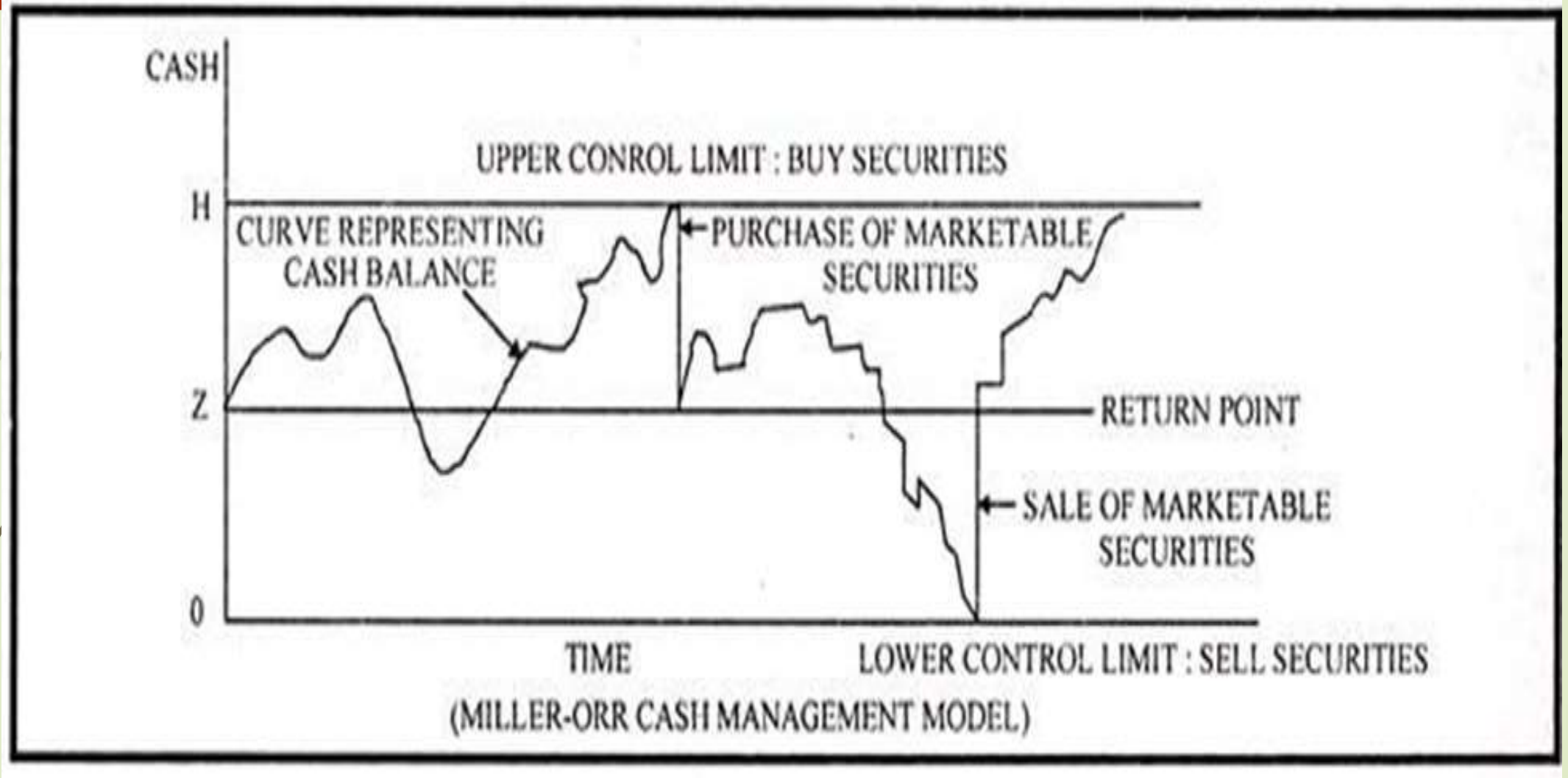
Practice Example 2

Miller and Orr Model

- $Z = 3 [(3/4 \times \text{Transaction cost} \times \text{variance of cash flows}) / \text{Interest rate}]^{(1/3)}$
- Where,
- Z = Spread between lower and upper cash balances
 - Return point = Lower limit + $[Z/3]$
 - Upper control level = Minimum cash balance + Spread (Z)
 - Variance of cash flows = Standard deviation²

Practice Example 3

Miller and Orr Model



Example:

The annual cash requirement of a company is INR 1000000. The company has marketable securities in lot sizes of INR 50000, INR 100000, INR 200000, INR 250000 and INR 500000. Cost of Conversion of marketable securities per lot is INR 1000. The company can earn 5% annual yield on its marketable securities. You are required to prepare a table indicating which lot size will have to be sold. Also calculate the Economic Lot Size.

Economic Lot Size

Where C = Economic Lot Size

A = Annual Requirement of Cash = 1000000

F = Fixed Conversion Cost Per Transaction = 1000

O = Opportunity Cost of Holding Cash = 5% i.e 0.05

$$C = \sqrt{\left[\frac{2A \times F}{O} \right]}$$

$$C = \sqrt{\left[\frac{2 \times 1000000 \times 1000}{0.05} \right]}$$

$$C = 200000$$

Identification of the Lot Size to be Sold:

Particulars	50000 Lot	100000 Lot	200000 Lot	250000 Lot	500000 Lot
(a) Annual Cash Requirement	1000000	1000000	1000000	1000000	1000000
(b) Lot Size of Securities	50000	100000	200000	250000	500000
(c) Number of Lots (a /b)	20	10	5	4	2
(d) Average Holding Cash (b /2)	25000	50000	100000	125000	250000
(e) Holding Cost (d X 5%)	1250	2500	5000	6250	12500
(f) Conversion Cost per Conversion	1000	1000	1000	1000	1000
(g) Total Conversion Cost (c X f)	20000	10000	5000	4000	2000
Total Cost (e + g)	21250	12500	10000	10250	14500

It can be noticed that the total cost is minimum at a Lot which is Economic Lot Size i.e. INR 200000

Example 2: Consider the following data of a company:

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Monthly requirement of Cash = 100000

Fixed Conversion Cost of Cash = 1000 per transaction

Opportunity cost of Holding Cash = 5%.

Calculate the following:

- a) Economic Lot Size of the Cash
- b) Total Conversion Cost Per Annum
- c) Total Holding Cost per annum

Solution:

Economic Lot Size:

$$C = \sqrt{\left[\frac{2A \times F}{O} \right]}$$

Monthly Demand of Cash = 100000

Annual Demand of Cash (A) = 100000 X 12 = 1200000

Fixed Conversion Cost (F) = 10000

Opportunity Cost (O) = 5% i.e. 0.05

Economic Lot Size =

$$C = \sqrt{\left[\frac{2 \times 1200000 \times 1000}{0.05} \right]}$$

$$= 6,92,820$$

Total Conversion Cost = (Annual Demand / Economic Lot Size) X Conversion Cost per each Transaction

$$= (1200000 / 692820) \times 1000$$

$$= 1732$$

Total Holding Cost = (Economic Lot Size / 2) X % of Opportunity Cost

$$= (692820 / 2) \times 0.05$$

$$= 1732.$$

Miller and Orr Model Illustration

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Example: A company has a policy of maintaining a minimum cash balance of INR 100000. The standard deviation in daily cash balance is INR 10000. The interest rate on daily basis is 0.01%. The transaction cost of each sale or purchase of securities is INR 50. Calculation of the Upper Control

Limit and the Return point.
$$Z = 3 \sqrt[3]{\frac{\frac{3}{4} \times \frac{\text{Transaction Cost} \times \text{Variance of Cash Flows}}{\text{Interest Rate}}}$$

$$Z = 3 \sqrt[3]{\frac{\frac{3}{4} \times \frac{50 \times 10000^2}{0.0001}}{}}$$

$$\text{Return Point} = \text{Lower Limit} + (Z/3)$$

$$Z = 100415$$

$$= 100000 + (100415/3)$$

$$\text{Upper Limit of Cash} = 100000 + 100415 = 200415$$

$$= 133472$$

Inventory Management

Inventory Control

Importance of inventory control

- Reducing risk of production shortages
- Reducing order cost
- Minimise the blockages of financial resources
- Avoiding lost sales
- Achieving efficient production scheduling
- Gaining quantity discounts
- Taking the advantage of price fluctuations
- Tiding over demand fluctuations
- Deciding timely replenishment of stocks

Methods of Inventory control

Methods of Inventory Control

- ABC system
- Budgetary control system
- Minimum-Maximum system
- The economic order quantity approach (Q) =
$$\sqrt{\frac{2Z \times C_o}{C \times C_c}}$$

Practice Example 4

Where, Q = Economic Ordering Quantity

Z = Annual demand

C_o = Cost per order

C = Cost per unit

C_c = % of carrying cost per unit per annum

- FSN analysis
- **VED Analysis**

Example: A company's annual demand of inventory is 10000 units. Cost per unit is INR 10. Ordering cost per order is INR 100. Carrying cost is 20% of cost per unit per annum. Calculate EOQ and also the total inventory cost.

From the above example,

Annual Demand (Z) = 10000

Ordering Cost Per Order (C_o) = 100

Cost per Unit (C) = 10

Carrying Cost (C_c) = 20%

$C \times C_c = 10 \times 20\% = 2$

$$\text{EOQ (Q)} \quad Q = \sqrt{\frac{2ZXCo}{CX Cc}} \quad Q = \sqrt{\frac{2 \times 10000 \times 100}{2}}$$

EOQ (Q) = 1000 Units.

Calculation of Total Inventory Cost.

Ordering Cost = $(Z / Q) \times Co = (10000 / 1000) \times 100 = 1000$

Carrying Cost = $(Q / 2) \times CX Cc = (1000 / 2) \times 2 = 1000$

Material Cost = $Z \times C = 10000 \times 10 = 100000$

Total Inventory Cost = $((Z / Q) \times Co) + ((Q / 2) \times CX Cc) + (Z \times C)$
 $= 1000 + 1000 + 100000 = 102000$

Receivables Management

Receivables management

Purpose of receivables management

- Creditworthiness of customers
- Minimise the cost of investment
- Minimize bad debt losses
- Formulate the credit terms – maximisation of sales revenue – maintaining minimum investment in receivables
- Minimise the cost of running credit and collection department
- Maintain a trade off between costs and benefits

Formulae

- $\text{Cost of goods sold (CGS)} = \text{Sales} - \text{Gross Profit}$
- $\text{Debtors turnover ratio (DTR)} = 360 / \text{Average collection period}$
- $\text{Average investment in debtors} = \text{Total credit sales} / \text{DTR}$
- $\text{Cost of average investment in debtors} = \text{Average investment in debtors} \times \text{Required rate of return}$
- $\text{Bad debts amount} = \text{Total credit sales} \times \% \text{ of bad debts}$

Practice Example 5

Debtors

Proforma to calculate Profit

	Particulars	Amt
	Total Credit sa	
	Less: Cost of goods sold	
	Gross Profit	
	Less: Fixed cost	
	Less: Cost of Avg investment in debtors	
	Less: Bad debts	
	Total Expenses	
	Net Profit (GP-Expenses)	

Example. A company's current sales are INR 1 Crore. Its Gross Profit is 40% of Sales. Its Fixed Cost is 10 Lakhs. Its Required Rate of Return is 10%. Its current average collection period is 30 days without any bad debts. It is considering an option of increasing the average collection period to 60 days which is expected to increase the sales volume by 30 % but there will be Bad Debts of 2% of sales. Advise the company on shifting to new credit policy. Assume that all sales are credit sales.

From the above data:

Current Sales = 1 Crore

Gross Profit = 40% of Sales = 40 lakhs

Cost of Goods Sold = Sales – Gross Profit = 1 Crore – 40 Lakhs = 60 Lakhs.

Average Collection Period = 30 Days

Debtors Turnover Ratio (DTR) = $360 / \text{Average Collection Period} = 360 / 30 = 12$

Average Investment on Debtors = $\text{Total Credit Sales} / \text{DTR} = 1 \text{ Crore} / 12 = 833333$

Required rate of Return = 10%

Cost of Average Investment on Debtors = $\text{Average Investment on Debtors} \times \text{Required rate of return}$
 $= 833333 \times 10\% = 83333$

Calculation of Profit under current credit policy|

Particulars	Amount in INR
Sales	10000000
Less: Cost of Goods Sold	6000000
Gross Profit	4000000
<u>Less : Fixed Cost</u>	1000000
<u>Less : Cost of Average Investment on Debtors</u>	83333
<u>Less : Bad Debts</u>	0
Total Expenses	1083333
Net Profit (Gross Profit – Expenses)	2916667

If the Company moves to new credit policy by increasing the average collection period to 60 days:

New Sales = 1 Crore + 30% of 1 Crore = 1.3 Crore

Gross Profit = 40% of Sales = 1.3 Crore X 40% = 52 Lakhs

Cost of Goods Sold = Sales – Gross Profit 1.3 Crore – 52 Lakhs = 78 Lakhs.

Average Collection Period = 60 Days

Debtors Turnover Ratio (DTR) = $360 / \text{Average Collection Period}$

$$= 360 / 60 = 6$$

Average Investment on Debtors = $\text{Total Credit Sales} / \text{DTR}$

$$= 1.3 \text{ Crore} / 6 = 2166667$$

Required rate of Return = 10%

Cost of Average Investment on Debtors = $\text{Average Investment on Debtors} \times \text{Required rate of return}$

$$= 2166667 \times 10\% = 216667$$

Bad Debts = $\text{Sales} \times 2\%$

$$1.3 \text{ Crores} \times 2\% = 260000$$

Calculation of Profit under new credit policy:

Calculation of Profit under new credit policy:

Particulars	Amount in INR
Sales	13000000
Less: Cost of Goods Sold	7800000
Gross Profit	5200000
<u>Less : Fixed Cost</u>	1000000
<u>Less : Cost of Average Investment on Debtors</u>	216667
<u>Less : Bad Debts</u>	260000
Total Expenses	1476667
Net Profit (Gross Profit – Expenses)	3723333

Conclusion: As the profit under new credit policy is 3723333 and the same in the old credit policy is only 2916667. Hence, it is advisable to shift to new credit policy by increasing the average collection period to 60 days.

Illustration

1. Consider the following data of a Company:

Selling Price	Rs.10
P/V Ratio	40%
Current Sales	1,00,000 Units
Fixed Cost	Rs.1 per Unit
Average Collection Period	30 Days
Bad Debts	0% of Sales
Required Rate of Return	10%

Assuming all sales are on credit basis, calculate Net Profit. If the company increases to its Average Collection Period to 45 days, its sales will increase by 20%, but debts will be 2% of Sales. If the Average Collection period is increased to 60 days, then the sales will increase to 30% with bad debts of 5% of sales. Which credit policy the company has to follow?

Solution:

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Working Notes:

Particulars	Current Sales
Number of Units sold	100000
Selling Price	10
Sales Volume (Units Sold X Selling Price)	1000000
P/V Ratio	0.4
Variable Cost (1-P/V Ratio)	0.6
Total Variable Cost (Sales Volume X % of <u>variable</u> Cost)	600000
Total Contribution (Sales Volume - Total Variable Cost)	400000
Fixed Cost (10 X 100000 <u>Units</u>)	100000
Average <u>Collection</u> Period in Number of Days	30
Debtors Turnover Ratio (360 / ACP)	12
Average Investment on Debtors (Sales Volume / DTR)	83333.33333
Required Rate of Return	0.1
Cost of Average Investment on Debtors (Average Investment X Required return)	8333.333333
Bad Debts as % of Sales Volume	0
Bad Debts in Rupees (Sales Volume X Bad Debts %)	0

Calculation Profit Under Current Average Collection Period:

particulars	Amount in Rupees
Sales	1000000
Less: Variable Costs	600000
Total Contribution	400000
Less: Fixed Cost	100000
Operating Profit	300000
Cost of Avg Investment on Debtors	8333
Bad Debts	0
Profit	291667

When Average Collection Period is **increased** to 45 Days

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Particulars	Sales Increase by 20%
Number of Units sold	120000
Selling Price	10
Sales Volume (Units Sold X Selling Price)	1200000
P/V Ratio	0.4
Variable Cost (1-P/V Ratio)	0.6
Total Variable Cost (Sales Volume X % of <u>variable</u> Cost)	720000
Total Contribution (Sales Volume - Total Variable Cost)	480000
Fixed Cost (10 X 100000 <u>Units</u>)	100000
Average <u>Colloection</u> Period in Number of Days	45
Debtors Turnover Ratio (360 / ACP)	8
Average Investment on Debtors (Sales Volume / DTR)	150000
Required Rate of Return	0.1
Cost of Average Investment on Debtors (Average Investment X Required return)	15000
Bad Debts as % of Sales Volume	0.02
Bad Debts in Rupees (Sales Volume X Bad Debts %)	24000

When Average Collection Period is **increased** to 45 Days

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Calculation of Profit:

Particulars	Amount in Rupees
Sales	1200000
Less: Variable Costs	720000
Total Contribution	480000
Less: Fixed Cost	100000
Operating Profit	380000
Cost of Avg Investment on Debtors	15000
Bad Debts	24000
Profit	341000

When Average Collection Period is increased to 60 Days,

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Particulars	Sales Increase by 30%
Number of Units sold	130000
Selling Price	10
Sales Volume (Units Sold X Selling Price)	1300000
P/V Ratio	0.4
Variable Cost (1-P/V Ratio)	0.6
Total Variable Cost (Sales Volume X % of <u>variable</u> Cost)	780000
Total Contribution (Sales Volume - Total Variable Cost)	520000
Fixed Cost (10 X 100000 <u>Units</u>)	100000
Average <u>Colloection</u> Period in Number of Days	60
Debtors Turnover Ratio (360 / ACP)	6
Average Investment on Debtors (Sales Volume / DTR)	216666.6667
Required Rate of Return	0.1
Cost of Average Investment on Debtors (Average Investment X Required return)	21666.66667
Bad Debts as % of Sales Volume	0.05
Bad Debts in Rupees (Sales Volume X Bad Debts %)	65000

When Average Collection Period is increased to 60 Days,

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Calculation of Profit:

particulars	Amount in Rupees
Sales	1300000
Less: Variable Costs	780000
Total Contribution	520000
Less: Fixed Cost	100000
Operating Profit	420000
Cost of Avg Investment on Debtors	21667
Bad Debts	65000
Profit	333333

Observation:

Average Collection Period	Sales
30 Days	291667
45 Days	341000
60 Days	333333

Conclusion:

As Profit is highest when the Average Collection Period is 45 Days, the firm has to switch to this policy.

Thank You

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