

Introduction to Finance

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MGM237

Lecture 5



Introduction To Finance

Lecture 5

MGM237 Working Capital Management

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Chapter

05

Working Capital Management





Chapter

5

Working Capital Management analysis

Introduction to Working Capital

Importance of Working Capital Management

Components of Working Capital

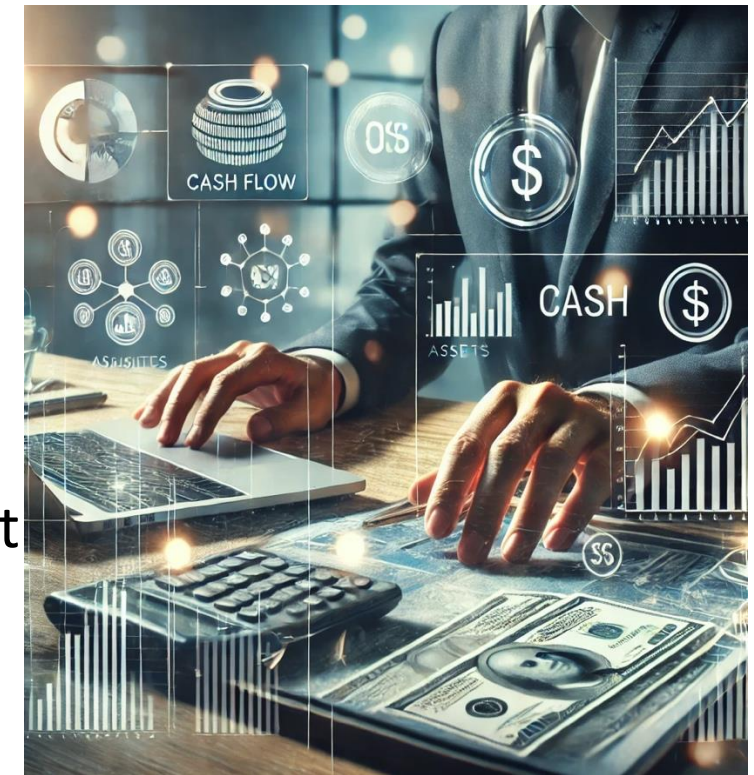
Current Assets Management

Current Liabilities Management

Introduction to Working Capital

Understanding Working Capital

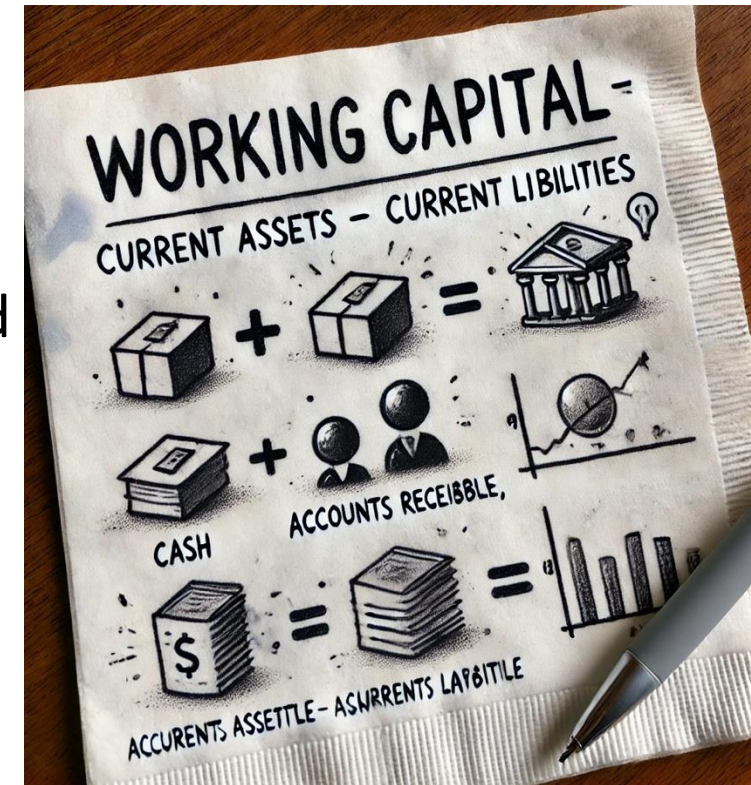
- **Working Capital** is a fundamental financial metric that assesses a company's ability to manage its short-term obligations.
- It represents the capital available for the day-to-day operations of a business.
- Effective management of working capital ensures that a company can continue its operations without financial interruptions.



Introduction to Working Capital

Formula:

- Working Capital = Current Assets – Current Liabilities
- **Current Assets** include cash, accounts receivable, inventory, and other assets expected to be converted to cash within a year.
- **Current Liabilities** encompass obligations like accounts payable, short-term debt, and other liabilities due within a year.



Introduction to Working Capital

Components of Working Capital

•Current Assets:

- **Cash and Cash Equivalents:** Liquid funds available for immediate use.
- **Accounts Receivable:** Money owed by customers for goods or services delivered.
- **Inventory:** Raw materials, work-in-progress, and finished goods ready for sale.
- **Short-term Investments:** Investments that can be quickly converted to cash.

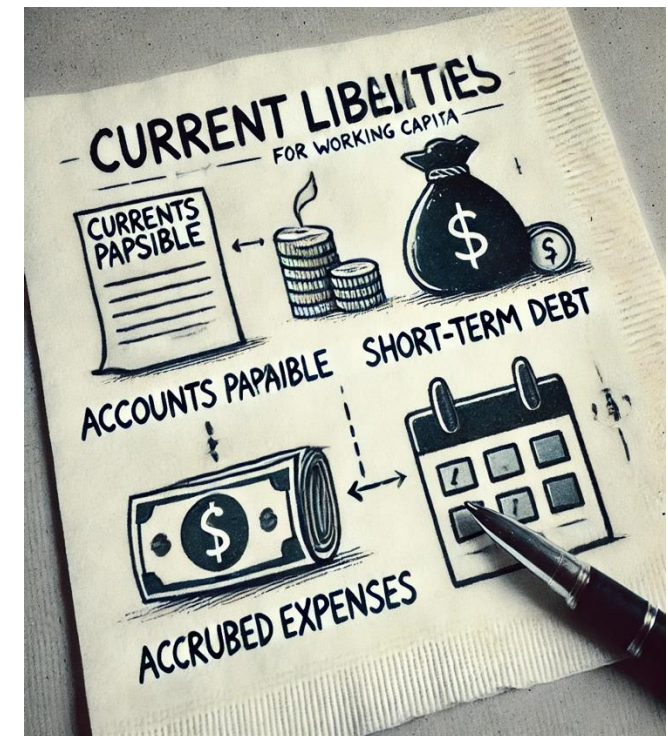


Introduction to Working Capital

Components of Working Capital

•Current Liabilities:

- **Accounts Payable:** Obligations to suppliers for goods and services received.
- **Short-term Debt:** Loans and other borrowings due within a year.
- **Accrued Expenses:** Expenses that have been incurred but not yet paid.



Chapter
05

Importance of Working Capital Management

Importance of Working Capital

- **Operational Efficiency:**

- Ensures smooth functioning of daily business activities by providing necessary funds.

- **Liquidity Management:**

- Maintains the ability to meet short-term liabilities without raising external capital.

- **Financial Health Indicator:**

- Serves as a barometer for a company's financial stability and operational success.



Chapter
05

Importance of Working Capital Management

Importance of Working Capital

•Facilitates Growth:

- Provides the necessary resources to invest in expansion, inventory buildup, and other growth initiatives.

•Enhances Creditworthiness:

- Positive working capital improves relationships with lenders and suppliers by demonstrating financial reliability.



Components of Working Capital

Working Capital Management

Working capital management includes current assets management and current liabilities management.

The goal is to achieve balance between profitability and risk.

Current Assets
Management



Profitability



Current Liabilities
Management



Risk



Working capital management

Efficient working capital management reduce financing costs & increase available funds for Expansion.

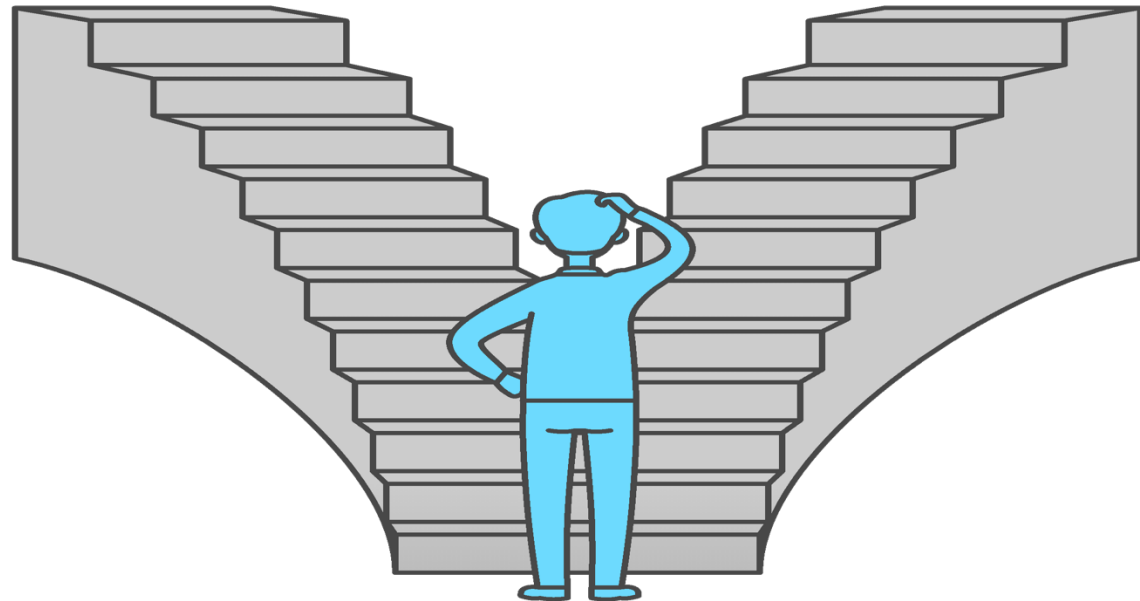
How to manage working capital?

Increase current assets

Higher liquidity, but may reduce profitability.

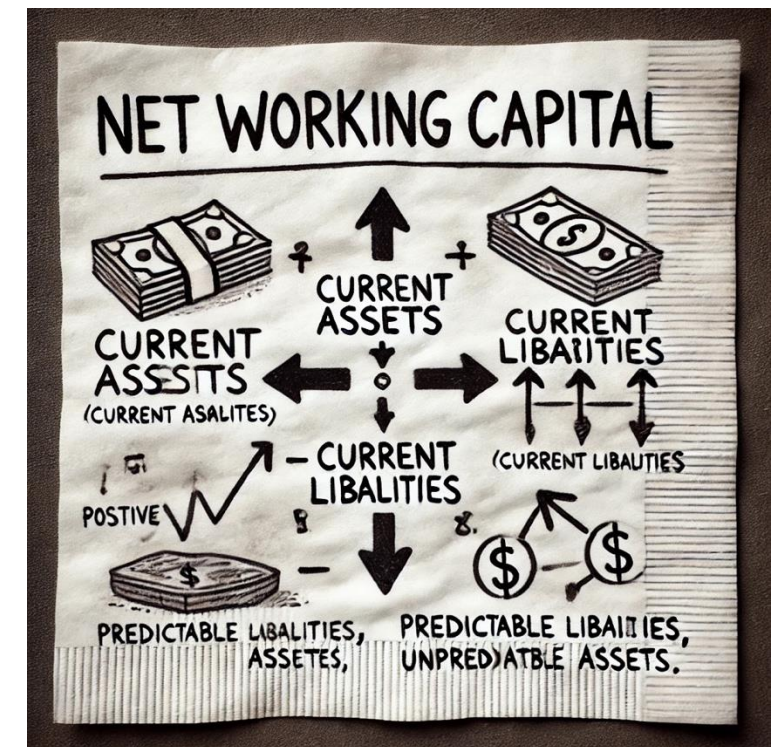
Decrease current liabilities

Lower financial risk, but may affect cash flow.



Introduction to Financial Ratio Analysis

- Net working capital is the difference between current assets and current liabilities. It could be positive or negative.
- Current liabilities are predictable.
- Current assets are difficult to be predicted.
- The more predictable cash inflows, the less networking capital a firm needs.
- Firms usually need more current assets to cover outflows of current liabilities.

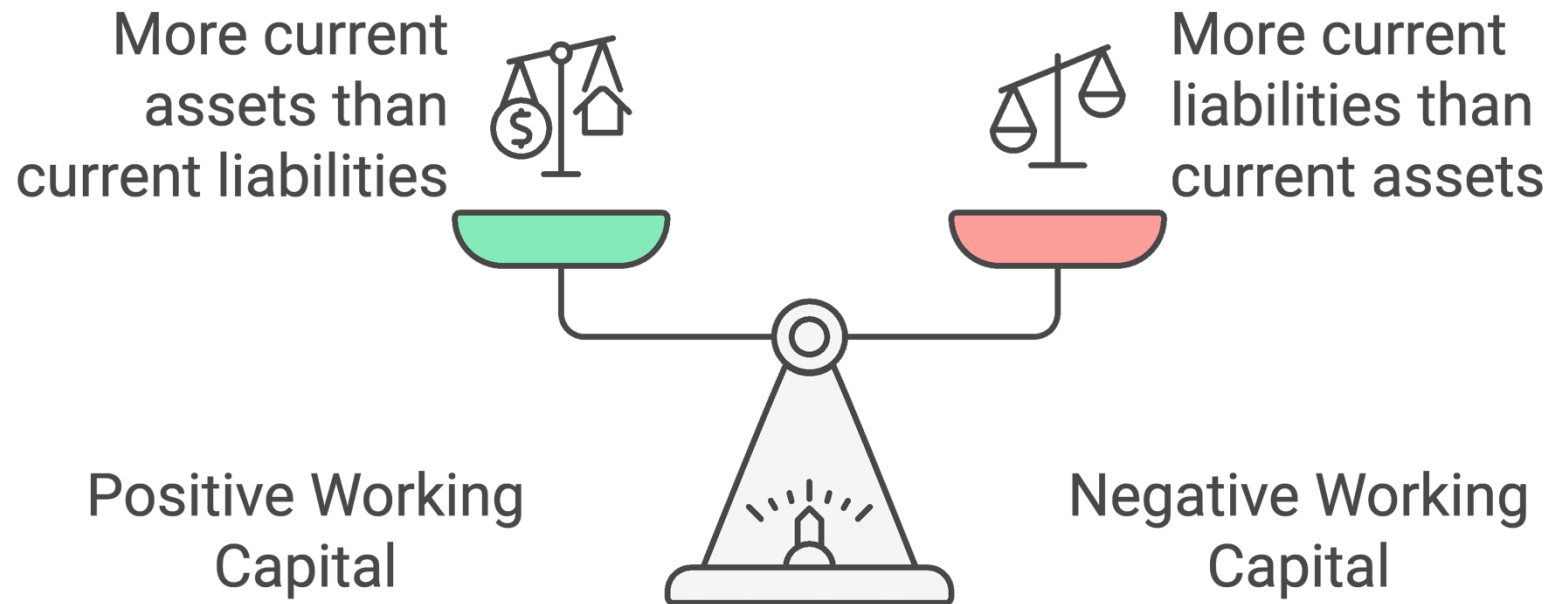


Working capital management

- **current liabilities are relatively predictable (cash outflow).**
- **But the conversion of the current assets to more liquid forms (cash inflow) may be not predictable with certainty.**



Working capital management



Understanding Net Working Capital

Cash Conversion Cycle:

Trade off between profitability and risk

Current Assets/Total Assets

Increase in Ratio: When the ratio of current assets to total assets increases, it typically indicates that a larger portion of the company's assets is made up of liquid assets (like cash, inventory, and receivables).

1.Effect on Profit: This can lead to a decrease in profit since more capital is tied up in liquid assets that may yield lower returns compared to long-term investments.

2.Effect on Risk: It also decreases risk because having more liquid assets can help a company meet its short-term obligations more easily.

Cash Conversion Cycle:

Trade off between profitability and risk

Current Assets/Total Assets

Decrease in Ratio: Conversely, a decrease in this ratio implies a smaller proportion of assets are liquid.

1.Effect on Profit: This can lead to an increase in profit as more capital is likely being invested in higher-return, long-term assets.

2.Effect on Risk: However, it increases risk because the company may have less liquidity to cover short-term obligations.

Cash Conversion Cycle:

Trade off between profitability and risk

Current Liabilities/Total Assets

Increase in Ratio: When this ratio increases, it means that a larger portion of total assets is financed by current liabilities (short-term debt).

1. Effect on Profit: This can lead to an increase in profit because it may indicate that the company is effectively using leverage to finance operations.

2. Effect on Risk: However, it also increases risk as higher short-term liabilities can strain cash flow and increase the chance of default if the company does not generate sufficient cash.

Cash Conversion Cycle:

Trade off between profitability and risk

Current Liabilities/Total Assets

Decrease in Ratio: A decrease in this ratio suggests a smaller portion of assets is financed by current liabilities.

- 1.Effect on Profit:** This might decrease profit as the company is relying less on leverage, potentially missing out on higher returns from investments.
- 2.Effect on Risk:** This decreases risk because lower reliance on short-term debt reduces the financial obligations that the company must meet in the near term.

Working capital management

Trade off between profitability and risk

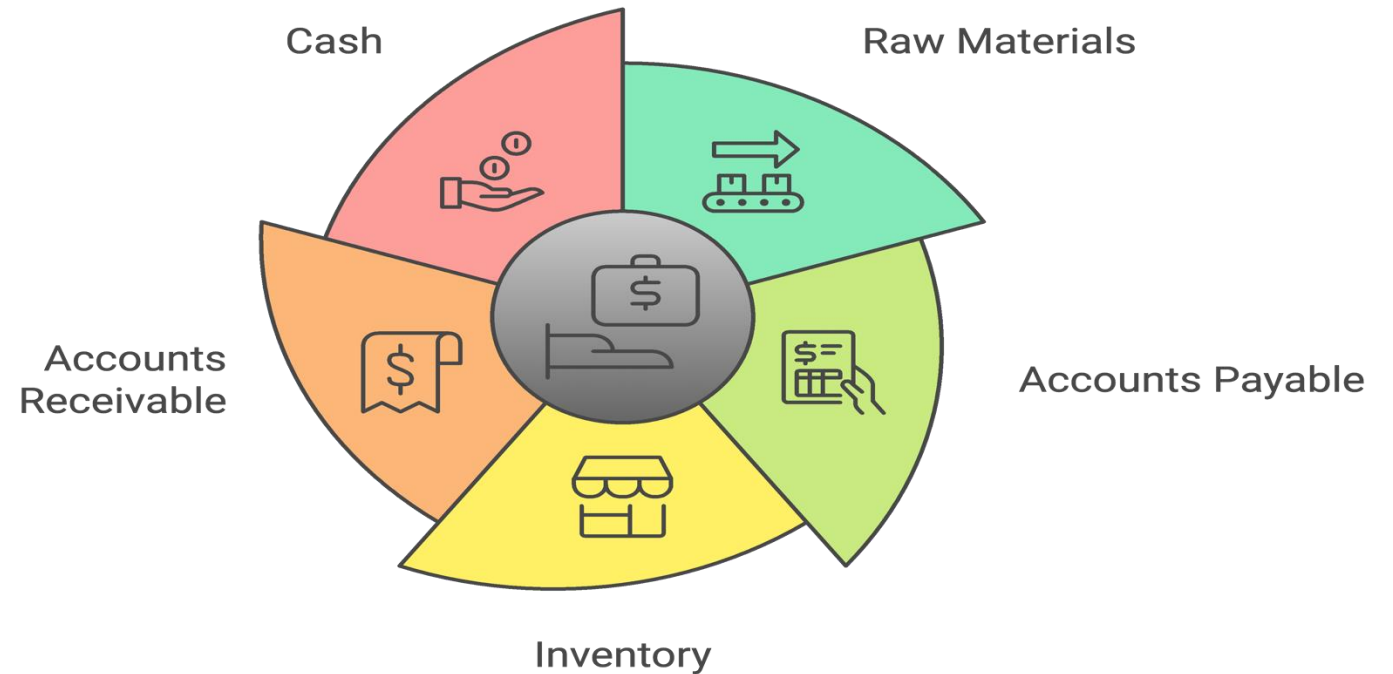
<u>Ratio</u>	Change in ratio	Effect on profit	Effect on risk
Current assets/total assets	Increase	Decrease	Decrease
Current assets/total assets	Decrease	Increase	Increase
Current liabilities / total assets	Increase	Increase	Increase
Current liabilities / total assets	Decrease	Decrease	Decrease

Cash Conversion Cycle:

Cash Conversion Cycle:

Measures the length of time required for a company to convert cash invested in its operations to cash received from its operations.

Understanding the Cash Conversion Cycle



Cash Conversion Cycle:

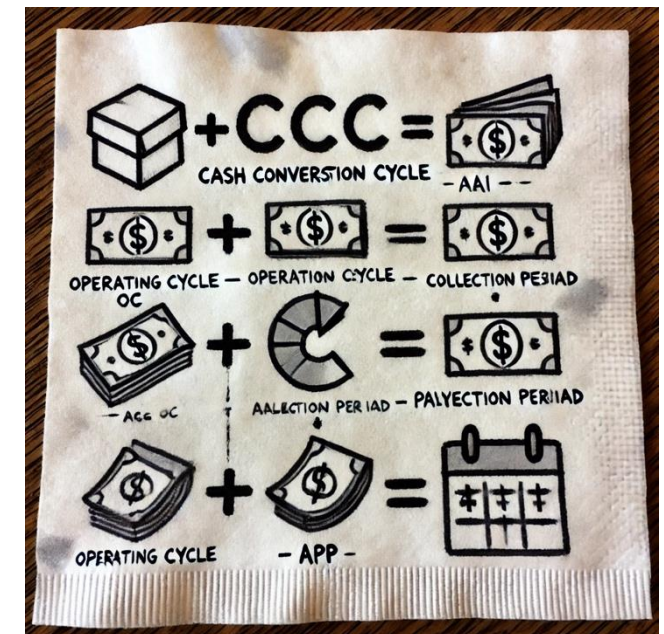
Cash Conversion Cycle:

$$CCC = OC - APP$$

$$CCC = AAI + ACP - APP$$

Operating cycle (OC) = Average Age of Inventory (AAI)
+ Average Collection Period (ACP)

Time to pay A/P Average Payment Period (APP)



Example 1: ABC provides the following information:

Average Age of Inventory (AAI) = 90 days

Average Collection Period (ACP) = 201 days

Average Payment Period (APP) = 208 days

Required: calculate the cash conversation cycle for ABC company

Solution:

- **$CCC = AAI + ACP - APP$**
- **$CCC = 90 + 201 - 208$**
- **$CCC = 83 \text{ days}$**

AAI = Average Age of Inventory

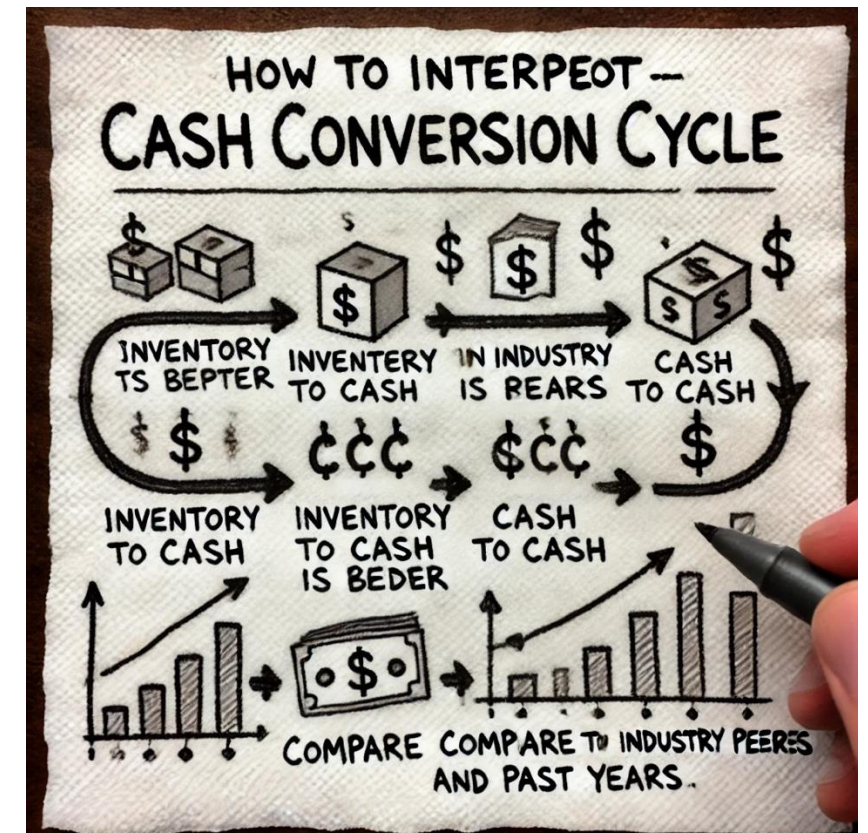
ACP = Average Collection Period

APP = Average Payment Period

Cash Conversion Cycle:

Interpreting the Cash Conversion Cycle

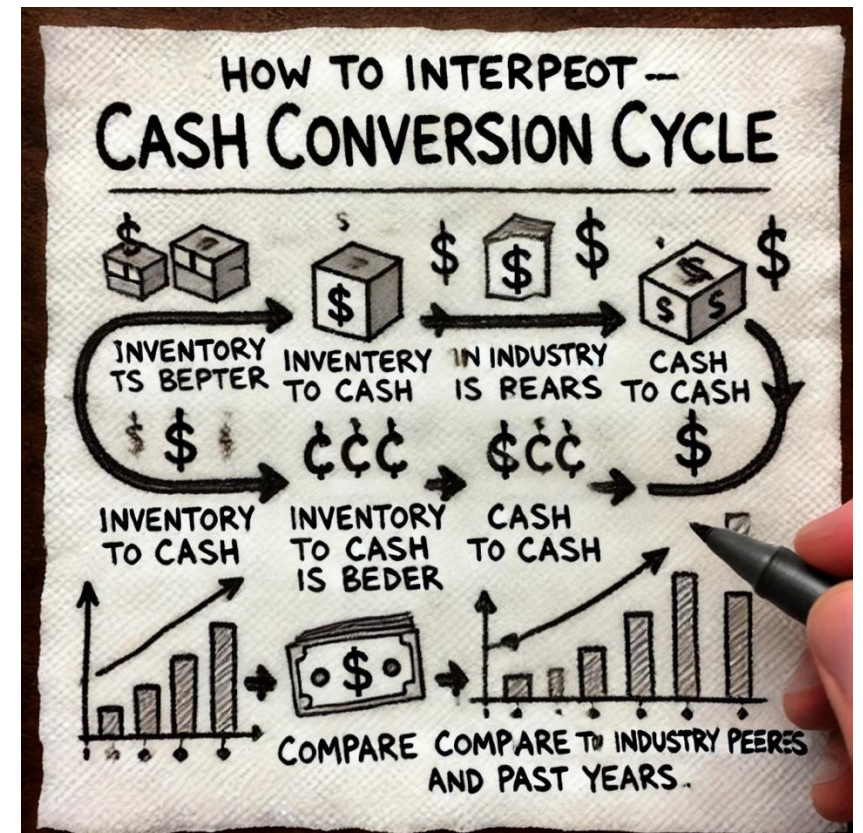
- The CCC formula is aimed at assessing how efficiently a company is managing its working capital. As with other cash flow calculations, the shorter the cash conversion cycle, the better the company is at selling inventories and recovering cash from these sales while paying suppliers.



Cash Conversion Cycle:

Interpreting the Cash Conversion Cycle

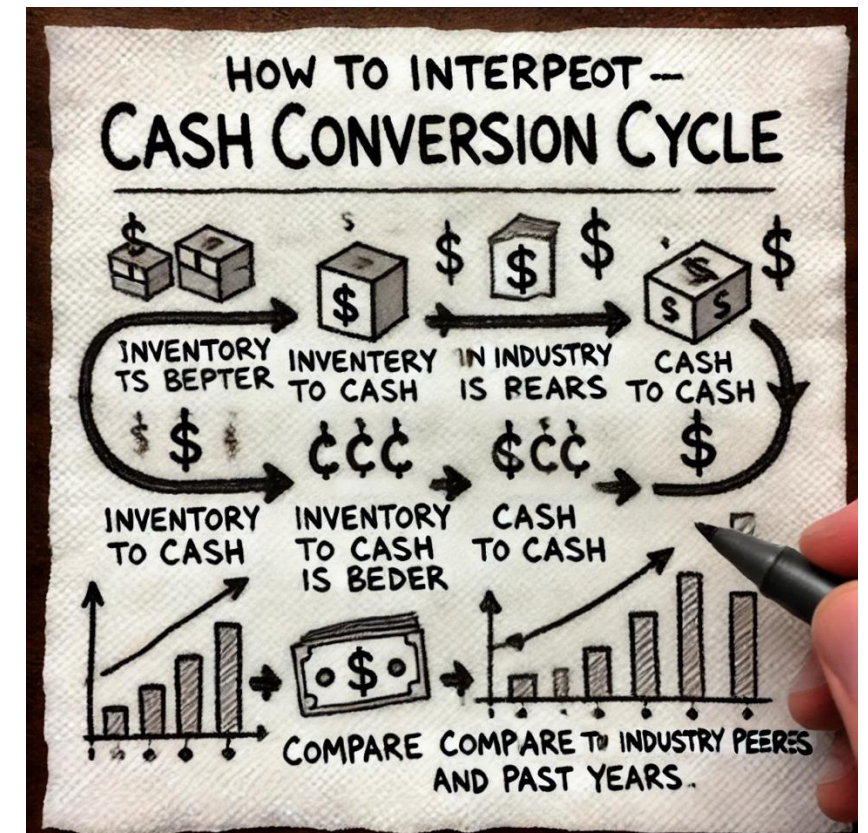
- The cash conversion cycle should be compared to companies operating in the same industry and conducted on a trend. For example, measuring a company's conversion cycle to its cycles in previous years can help with gauging whether its working capital management is deteriorating or improving.



Cash Conversion Cycle:

Interpreting the Cash Conversion Cycle

- In addition, comparing the cycle of a company to its competitors can help with determining whether the company's cash conversion cycle is "normal" compared to industry competitors.



Cash Conversion Cycle:

Example2:

MAX Company has annual sales of \$10 million, cost of goods sold of 75% of sales, and purchases that are 65% of cost of goods sold. MAX has an average age of inventory (AAI) of 60 days, an average collection period (ACP) of 40 days, and an average payment period (APP) of 35 days. (Assume the year has 365 days)

1. Calculate the CCC.
2. Calculate cash resources invested or tied up to the cash conversion cycle.
3. How will a 5-day reduction in ACP affect the resources invested in the CCC?

Cash Conversion Cycle:

Solution:

1. Calculating CCC:

- $CCC = AAI + ACP - APP$
- $CCC = 60 + 40 - 35$
- $CCC = 65\text{days}$

AAI = Average Age of Inventory

ACP = Average Collection Period

APP = Average Payment Period

Cash Conversion Cycle:

2) Calculate cash resources invested or tied up to the cash conversion cycle.

Inventory = Cost of goods sold $\times$ AAI / 365 = \$ Inventory

+ Accounts receivable = Sales $\times$ ACP / 365 = + \$ A/R

-Accounts payable = Purchases $\times$ APP 365 = - \$ A/P

Total Resources Invested in the cash conversion cycle \$\$\$

Cash Conversion Cycle:

Inventory=	$(10,000,000 * 0.75) * 60/365$	\$ 1,232,877
+A/R	$10,000,000 * 40/365$	+ \$ 1,095,890
-A/P	$(10,000,000 * 0.75 * 0.65) * 35/365$	- \$ 467,466
Total Resources Invested in the cash conversion cycle		\$ 1,861,301

Cash Conversion Cycle:

3. How will a 5-day reduction in ACP affect the resources invested in the CCC?

Inventory=	$(10,000,000 * 0.75) * 60 / 365$	\$ 1,232,877
+A/R	$10,000,000 * 35 / 365$	+ \$ 958,904
-A/P	$(10,000,000 * 0.75 * 0.65) * 35 / 365$	- \$ 467,466
Total Resources Invested in the cash conversion cycle		\$ 1,724,315

Reduced A/R resources = $1,095,890 - 958,904 = \$ 136,986$

5-day reduction in ACP will reduce resources invested in accounts receivable and will reduce resources invested in the CCC

Cash Conversion Cycle:

Funding Requirements for Cash Conversion Cycle

If the firm's sales are **constant**, then its **investment in operating assets should also be constant**, and the firm will have only a **permanent funding requirement**. If the firm's sales are **cyclic**, then **its investment in operating assets will vary over time with its sales cycles**, and the firm will have **seasonal funding requirements** in addition to the permanent funding required for its minimum investment in operating assets.



Cash Conversion Cycle:

Funding Requirements for Cash Conversion Cycle

Firm Sales	Funding requirement
constant	permanent funding
cyclic	permanent funding + seasonal funding

Working capital management

Example3:

ABC Company holds, on average **\$50,000 in cash** and marketable securities, **\$1,250,000 in inventory**, and **\$750,000 in accounts receivable**. ABC'S **business is very stable** over time, so its operating assets can be viewed as **permanent**. In addition, ABC'S **accounts payable of \$425,000** are stable over time.

Working capital management

Solution:

ABC has a permanent investment in operating assets of

Cash	50,000
Inventory	1,250,000
A/R	750,000
A/p	(425,000)
Permanent funding requirement	1,625,000

Working capital management

Example4:

MAX Company, which produces bicycle pumps, has seasonal funding needs. MAX has seasonal sales, with its peak sales being driven by the summertime purchases of bicycle pumps. Semper holds, **at minimum, \$25,000 in cash, \$100,000 in inventory, and \$60,000 in accounts receivable.**

At peak times, MAX's inventory increases to \$750,000, and its accounts receivable increase to \$400,000. To capture production efficiencies, Semper produces pumps at a constant rate throughout the year. Thus, **accounts payable remain at \$50,000 throughout the year.**

Working capital management

Solution:

Funding Requirement for MAX Company:

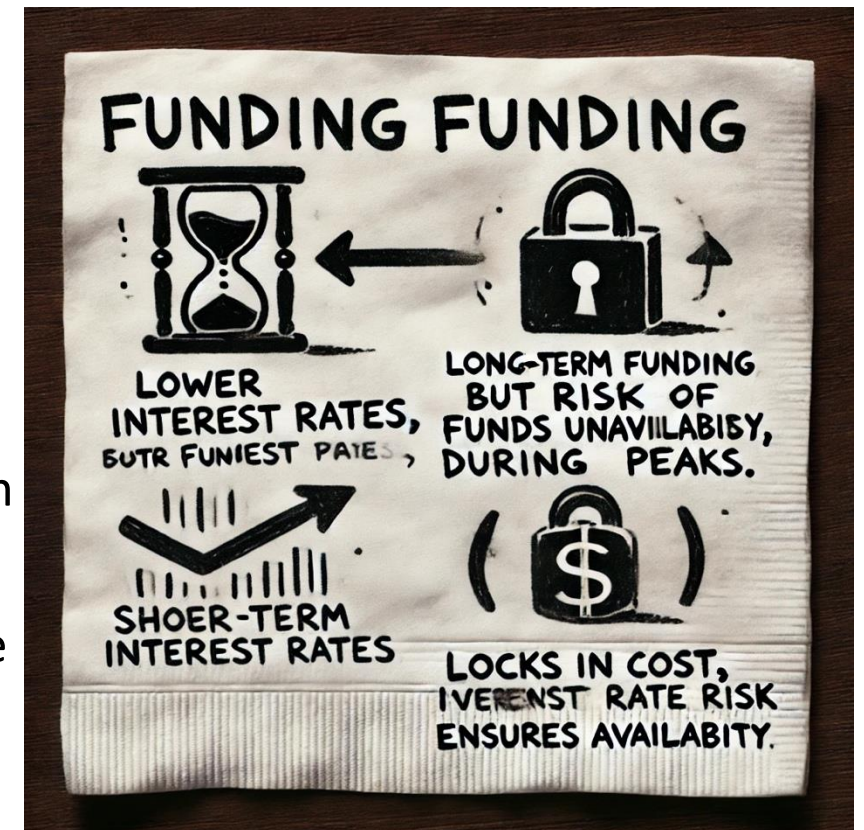
Permanent funding		Seasonal funding
Cash	25,000	
Inventory	100,000	$(750,000 - 100,000) = 650,000$
A/R	60,000	$(400,000 - 60,000) = 340,000$
A/P	50,000	
135,000		990,000

MAX funding requirements for operating assets vary from a minimum of \$135,000 (permanent) to a seasonal peak of \$1,125,000 (\$135,000 + \$990,000)

Funding Strategies

Funding Strategies:

- Short-term funds are typically less expensive. That is, interest rates on short-term loans are typically lower. However;
- Short-term funding exposes the firm to the risk that it may not be able to obtain the funds needed to cover its seasonal peaks.
- long-term funds allow the firm to lock in its cost of funds over a period of time and thus avoid the risk of increases in short-term interest rates.
- long-term funding ensures that the required funds are available to the firm when needed.



Funding Strategies

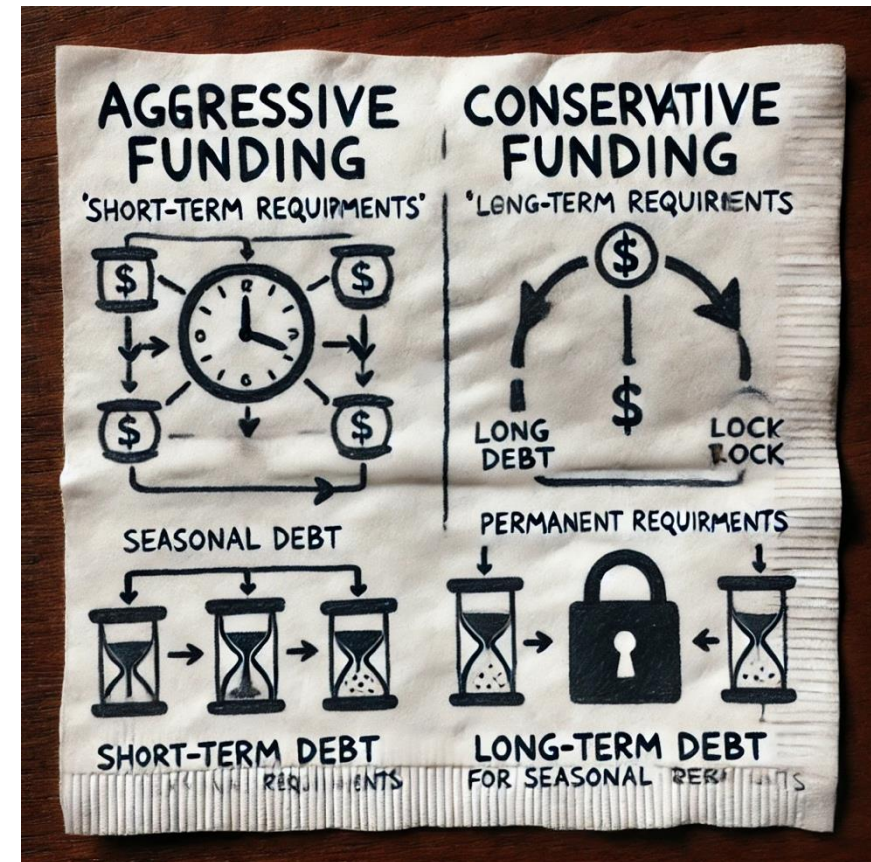
Funding Strategies:

aggressive funding strategy

A funding strategy under which the firm funds its seasonal requirements with short-term debt and its permanent requirements with long-term debt.

conservative funding strategy

A funding strategy under which the firm funds both its seasonal and its permanent requirements with long-term debt.



Working capital management

Funding Strategies:

Aggressive versus Conservative Funding Strategies:

Short term fuds

- Less Expensive

Long term fuds

- risk of increases in short-term interest rates.
- ensures that required funds are available when needed.

Working capital management

Funding Strategies:

Aggressive versus Conservative Funding Strategies:

Aggressive funding strategy		Conservative funding strategy	
Permanent	Long-term fuds	Permanent	Long-term fuds
Seasonal	Short-term fuds	Seasonal	Long-term fuds

Working capital management

Example5:

MAX Company has a permanent funding requirement of \$135,000 in operating assets and seasonal funding requirements that vary between \$0 and \$990,000 and average \$101,250 (calculated from data not shown).

If MAX can borrow short-term funds at 6.25%,
long-term funds at 8%,
can earn 5% on the investment of any MAX surplus balances,

Calculate the cost of Aggressive and conservative strategy

Working capital management

Solution:

Aggressive Seasonal Funding Strategy:

Cost of short-term financing ($6.25\% \times \$101,250$)	6,328
+ Cost of long-term financing ($8\% \times \$135,000$)	10,800.00
- Earnings on surplus balances ($5\% \times 0$)	-

Total cost of aggressive strategy	17,128
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Note: under this strategy the amount of financing exactly equals the estimated funding need, no surplus balances exist.

Working capital management

Conservative Seasonal Funding Strategy:

Surplus= seasonal peak need - (permanent need + average seasonal need)

$$= 1,125,000 - (135,000 + 101,250) = 888,750$$

Cost of short-term financing (6.25% x \$0)	-
+ Cost of long-term financing (8% x \$1,125,000)	90,000
- Earnings on surplus balances (5% x 888,750)	44,437
Total cost of aggressive strategy	45,562

Working capital management

Aggressive versus Conservative Seasonal Funding Strategies:

Comment,

- aggressive strategy → short-term financing → riskier

(Interest rate swings & difficulties in obtaining short-term financing quickly when seasonal peaks occur)

- conservative strategy avoids these risk, but it is more costly (8%-5%) in general

It depends on management's disposition toward risk and the strength of its **banking relationships.**

Working capital management

Strategies for Managing Cash conversion Cycle:

Firms have to minimize the length of the cash conversion cycle, which minimizes negotiated liabilities. This goal can be realized through use of the following strategies:

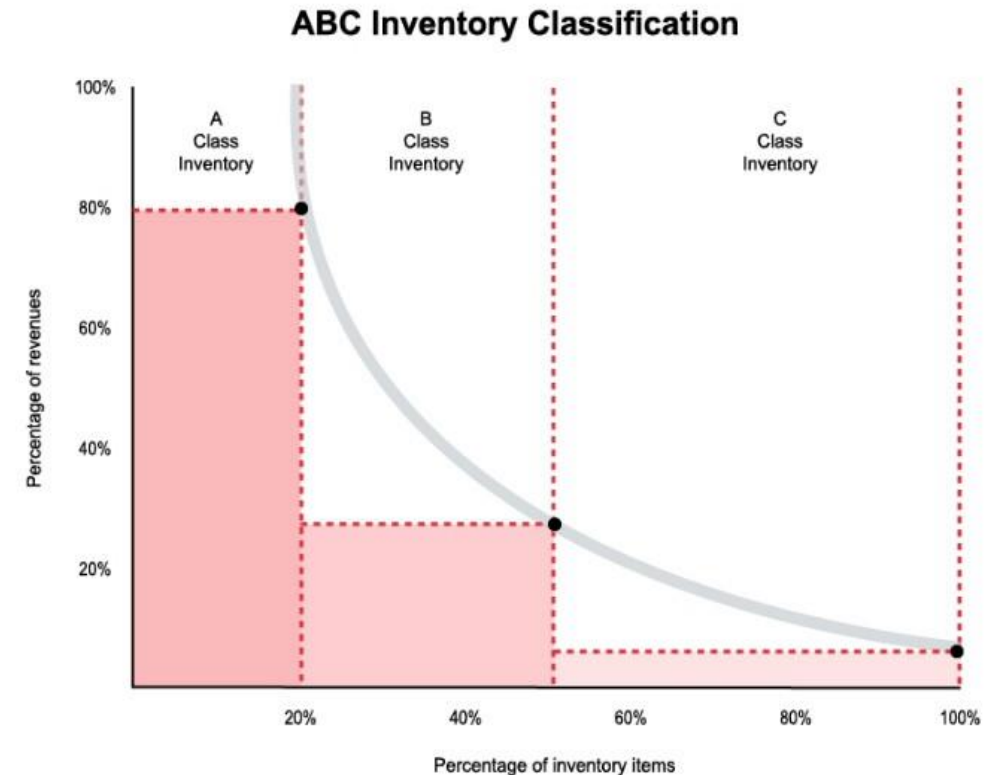
- Turn over inventory as quickly as possible without stock outs that result in lost sales.
- Collect accounts receivable as quickly as possible without losing sales from high-pressure collection techniques
- Pay accounts payable as slowly as possible without damaging the firm's credit rating.

Current Assets Management

COMMON TECHNIQUES FOR MANAGING INVENTORY

ABC Inventory Classification:

- **A Class Inventory:**
 - Represents high-value items.
 - Accounts for roughly **20% of inventory** but contributes about **80% of revenue**.
 - Items in this category are critical to monitor closely due to their high impact on business.

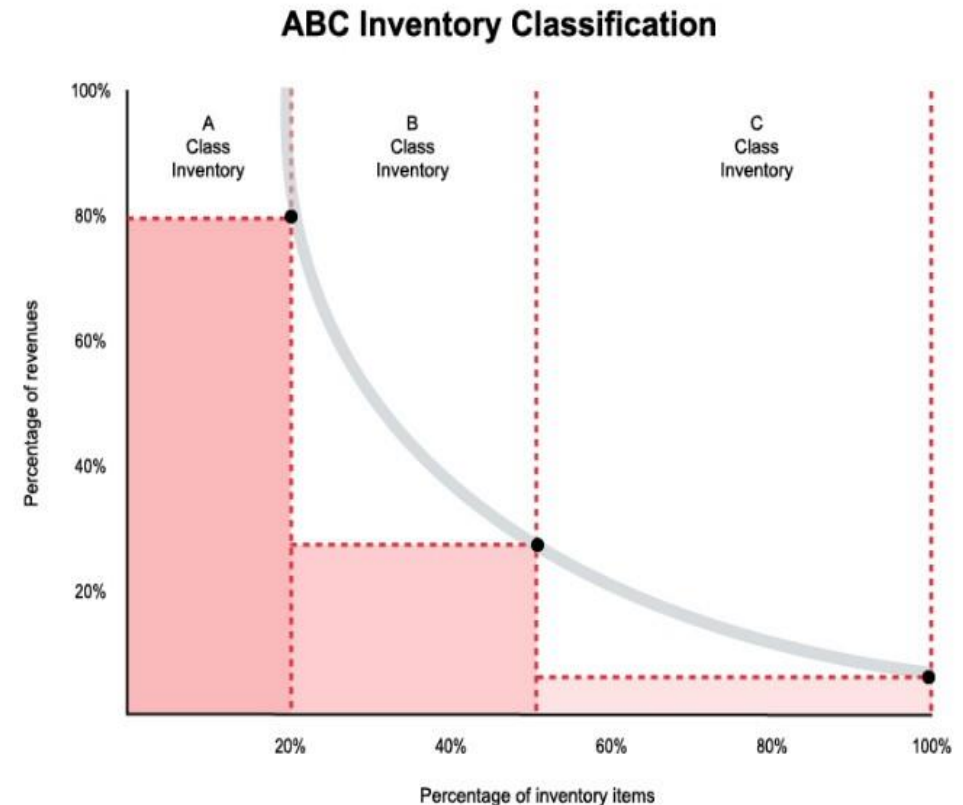


Current Assets Management

COMMON TECHNIQUES FOR MANAGING INVENTORY

ABC Inventory Classification:

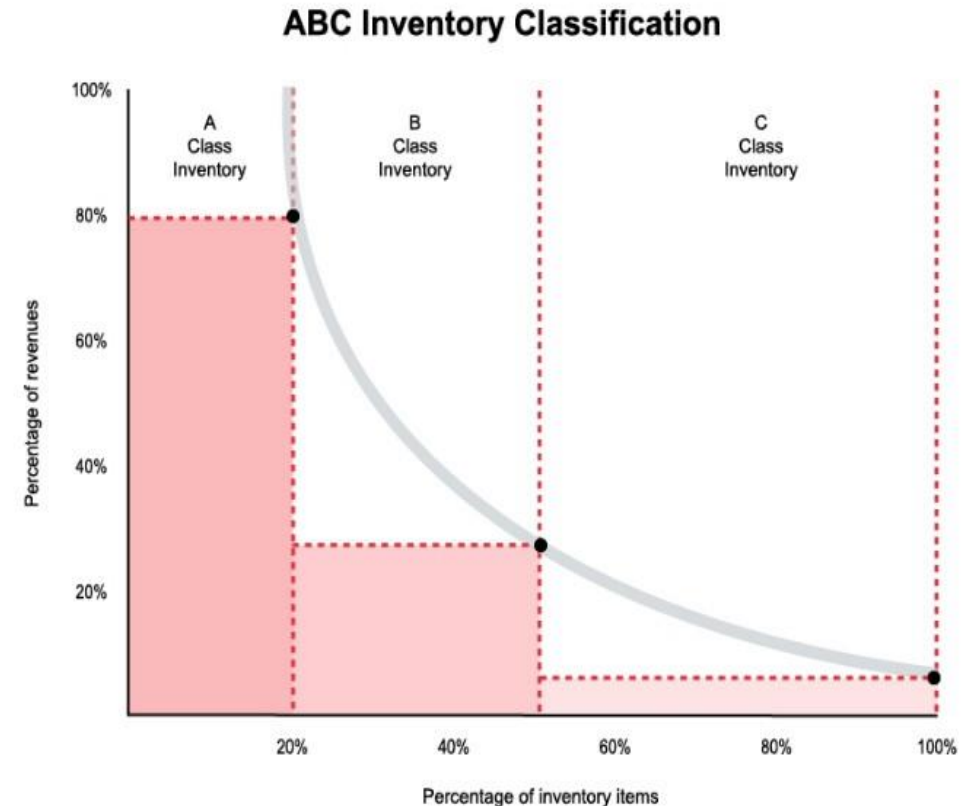
- **B Class Inventory:**
 - Moderate value items.
 - Typically makes up **30-40% of inventory** and contributes around **15% of revenue**.
 - These items need regular attention but don't require the same tight control as A items.



COMMON TECHNIQUES FOR MANAGING INVENTORY

ABC Inventory Classification:

- **C Class Inventory:**
 - Low-value items.
 - Comprises the largest portion of inventory (about **50% or more**) but only generates **5% of revenue**.
 - These items are low-priority and can be managed with less stringent controls.



Working capital management

Economic Order Quantity (EOQ) Model:

- Inventory management technique for determining an item's optimal order size, which is the size that minimizes the total of its order costs and carrying costs.
- order costs: The fixed clerical costs of placing and receiving an inventory order.
- carrying costs: The variable costs per unit of holding an item in inventory for a specific period of time.
- Order costs decrease as the size of the order increases. Carrying costs, however, increase with increases in the order size. The EOQ model analyzes the trade-off between order costs and carrying costs to determine the order quantity that minimizes the total inventory cost.

Working capital management

Economic Order Quantity (EOQ) Model:

The EOQ model considers various costs of inventory and then determines what order size minimizes total inventory cost

$$EOQ = \sqrt{\frac{2 \times S \times O}{C}}$$

Where:

- S = usage in units per period
- O = order cost per order
- C = carrying cost per unit per period

Working capital management

Economic Order Quantity (EOQ) Model:

Once the firm has determined its(EOQ), it must determine when to place an order

Reorder point = Days of lead time * Daily usage



Working capital management

Example6:

MAX Company, a producer of dinnerware, has an A group inventory item that is vital to the production process. This item costs \$1,500, and MAX uses 1,100 units of the item per year. MAX wants to determine its optimal order strategy for the item. According to the following information

Order cost per order = \$150

Carrying cost per unit per year = \$200

Working capital management

Solution:

$$EOQ = \sqrt{\frac{2 \times S \times O}{C}}$$

$$EOQ = \sqrt{\frac{2 \times 1,100 \times \$150}{\$200}} \approx \underline{\underline{41}} \text{ units}$$

Working capital management

Assuming that MAX operates 250 days

MAX lead time is 2 days, and MAX wants to maintain a safety stock of 4 units

- **Solution:**

Reorder point = Days of lead time * Daily usage

Days of lead time = 2

Daily usage = $1100 / 250 = 4.4$ unit

Reorder point = $(2 * 4.4) + 4 = 12.8$ unit

the order should be placed when the inventory falls to 13 units.

Current Liabilities Management

Example7:

- In 2009, (HP), the world's largest technology company, had annual revenue of \$114,552 million, cost of revenue of \$87,524 million, and purchases of \$ 89,492 million. HP had an average age of inventory (AAI) of 29.2 days, an average collection period (ACP) of 53.3 days, and an average payment period (APP) of 60.4 days.

Required

- Calculate the CCC.
- Calculate cash resources invested or tied up to the cash conversion cycle.
- How will a 5-day increase in APP affect the resources invested in the CCC?

Current Liabilities Management

Solution:

Calculating CCC:

- $CCC = AAI + ACP - APP$
- $CCC = 22.9 + 53.3 - 60.4$
 - $CCC = 22.1\text{days}$

AAI = Average Age of Inventory

ACP = Average Collection Period

APP = Average Payment Period

Current Liabilities Management

Solution:

Calculate cash resources invested or tied up to the cash conversion cycle:

Inventory = Cost of goods sold $\times$ AAI / 365 = \$ Inventory

+ Accounts receivable = Sales $\times$ ACP / 365 = + \$ A/R

-Accounts payable = Purchases $\times$ APP 365 = - \$ A/P

Total Resources Invested in the cash conversion cycle \$\$\$

Current Liabilities Management

Solution:

Calculate cash resources invested or tied up to the cash conversion cycle:

$$\text{Inventory} = 87,524\text{m} \times (29.2 / 365) = \$ 7,001,920,000$$

$$+ \text{Accounts receivable} = 114,552\text{m} \times (53.3 / 365) = +16,727,730,411 \$$$

$$- \text{Accounts payable} = 89,492\text{m} \times (60.4 / 365) = -14,809,087,123 \$$$

$$\text{Total Resources Invested in the cash conversion cycle} = 8,920,563,288 \$$$

Solution:

How will a 5-day increase in APP affect the resources invested in the CCC?

$$\text{Inventory} = 87,524\text{m} \times (29.2 / 365) = \$ 7,001,920,000$$

$$+ \text{Accounts receivable} = 114,552\text{m} \times (53.3 / 365) = +16,727,730,411 \$$$

$$- \text{Accounts payable} = 89,492\text{m} \times (65.4 / 365) = -16,035,004,931 \$$$

$$\text{Total Resources Invested in the cash conversion cycle} = 7,694,645,480 \$$$

Comment: conversion cycle will decrease to be 17.1 day $(29.2 + 53.3 - 65.4)$, and the firm would reduce its investment in operations by \$1,226 million $(8,920,563,288 - 7,694,645,480)$



Thank You