

## Working Capital Management

This topic will focus on how managers analyze and manage the elements of Working Capital  
Working Capital is Current/Short term Assets & Liabilities

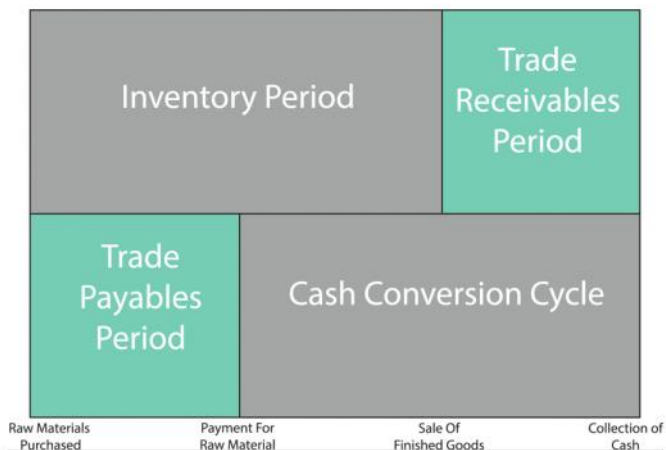
- **Current Assets**
  - Cash
  - Trade Receivables
  - Inventories
  - Prepaid Expenses
- **Current Liabilities**
  - Trade Payables
  - Accrued Wages

**Net Working Capital** = Current Assets – Current Liabilities (Measure to ensure the company can meet its short term needs)

Long Term/ Short Term Planning Decisions are made with the needs of Working Capital

## Working Capital Management

### Operating Cycle



$$\text{Inventory period} = \frac{\text{Average inventory}}{\text{Annual cost of sales}/365}$$

$$\text{Trade receivables period} = \frac{\text{Average trade receivables}}{\text{Annual sales}/365}$$

$$\text{Trade payables period} = \frac{\text{Average trade payables}}{\text{Annual cost of goods sold}/365}$$

**Note:** If using quarterly financial statement, sales are measured for the quarter so the sales per day equal quarterly sales divided by the number of days in the quarter.

$$\text{Cash conversion cycle} = (\text{inventory period} + \text{trade receivables period}) - \text{trade payables period}$$

$$\text{Operating Cycle} = \text{Inventory Period} + \text{Trade Receivables Period} \quad (\text{Not On Formula Sheet})$$

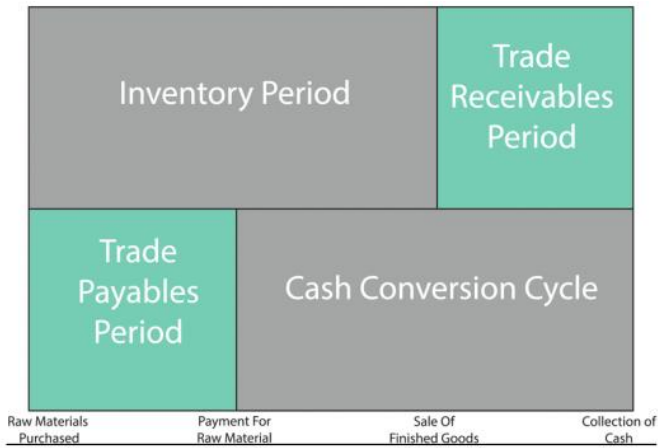
#### Example 1:

Calculate the **cash conversion cycle** and the **operating cycle** given the following:

Average Inventory	\$ 840.00
Average AR	\$ 600.00
Average AP	\$1,200.00
Sales	\$7,000.00
COGS	\$6,000.00

## Working Capital Management

### Operating Cycle



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$$\text{Cash conversion cycle} = (\text{inventory period} + \text{trade receivables period}) - \text{trade payables period}$$

$$\text{Operating Cycle} = \text{Inventory Period} + \text{Trade Receivables Period (Not On Formula Sheet)}$$

#### Example 2:

Compute the cash conversion cycle for a firm with \$3 million average inventory, \$1.8 million average trade receivables, \$1.3 million average trade payables, a quarterly cost of goods sold of \$8 million, and a quarterly sales of \$14 million. Please round your final answer to the nearest integer.

## Working Capital Management

### Economic Order Quantity (EOQ)

Management considerations with respect to inventory:

- How many units to order at a time?
- How many orders to place?

$$\text{Economic order quantity (EOQ)} = \sqrt{\frac{2 \times \text{annual sales} \times \text{cost per order}}{\text{carrying cost}}}$$

#### Large Orders have associated carrying costs:

Storage issues  
Obsolescence concerns  
Damage/theft

#### Small Orders have associated costs as well:

Availability of inventory when needed  
Order processing costs  
Shipping costs

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### Example 3:

What is the economic order quantity for firm that sells 50,000 units annually, each unit has a \$4 carrying cost, and the fixed cost of placing an order is \$50?

## Working Capital Management

### Initial Cash Balance

Management considerations with respect to cash and payment of expenses :

- How much cash to keep on hand vs. invested?
- How often to convert cash out of investments

$$\text{Initial cash balance} = \sqrt{\frac{2 \times \text{annual cash outflows} \times \text{cost per sale of securities}}{\text{interest rate}}}$$

### Too Much Cash:

Not earning optimal interest from investments

### Too Little Cash:

Not enough cash to meet immediate needs  
Cost of processing sale of investments

### Example 4:

A firm has estimated that it will need \$450,000 net cash during the year. Current interest rate on money market securities is 4 percent per year and the cost of buying and selling securities cost \$25 per transaction. What is the optimal cash balance?

### Example 5:

Cash-on-hand Corp. has an average amount of cash holdings of \$37,416.5. The firm invests its idle cash in T-bills which pay 5% annually and incurs a fixed cost of \$35 each time a cash conversion is made. What is the amount of Cash-on-hand Corp.'s annual cash outflows?

$$\text{Initial cash balance} = \sqrt{\frac{2 \times \text{annual cash outflows} \times \text{cost per sale of securities}}{\text{interest rate}}}$$

## Working Capital Management

### Calculating the Effective Annual Rate (EAR) For the interest on the following types of Bank Loan Interest

Simple Interest Bank Loan

Discount Interest Bank Loan

Compensating Interest Bank Loan

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#### **Example 6: Simple Interest Bank Loan**

A firm borrows \$100,000 for one month on a simple interest basis from the bank. The annual interest rate for this loan is 12%. What is the EAR of this loan?

1) Simple interest:

$$\text{Effective annual rate} = \left(1 + \frac{\text{quoted annual interest rate}}{m}\right)^m - 1.$$

## Working Capital Management

### Calculating the Effective Annual Rate (EAR) For the interest on the following types of Bank Loan Interest

Simple Interest Bank Loan

Discount Interest Bank Loan

Compensating Interest Bank Loan

#### **Example 7: Discount Interest Bank Loan**

A firm borrows \$100,000 for one month on a discount interest basis from the bank. The annual interest rate for this loan is 12%. What is the EAR of this loan?

2) Discount interest:

$$\text{Effective annual rate} = \left( \frac{1}{1 - \frac{\text{quoted annual interest rate}}{m}} \right)^m - 1.$$

## Working Capital Management

### Calculating the Effective Annual Rate (EAR) For the interest on the following types of Bank Loan Interest

Simple Interest Bank Loan  
Discount Interest Bank Loan  
Compensating Interest Bank Loan

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#### **Example 8: Compensating Interest Bank Loan**

A firm borrows \$200,000 from the bank for 6 months, but has to maintain a compensating balance of \$15,000 with the bank. The annual interest rate for the loan is 12% (APR) What is the effective annual interest rate?

3) Interest with compensating balances:

$$\text{Effective annual rate} = \left(1 + \frac{\text{actual interest paid}}{\text{borrowed funds available}}\right)^m - 1.$$

## Working Capital Management

### **Example 9: Factoring Receivables**

A company sells its \$100,000 AR to a factor for \$96,000. The average collection period is one month. What is the EAR of this factoring?

## Working Capital Management

For trade credit, effective annual rate =  $(1 + \frac{\text{discount}}{\text{discounted price}})^{\frac{365}{\text{extra days credit}}} - 1$ .

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**Example 10:**

A purchase of \$200 has terms 2/10, net 30, what is the implied interest rate for forgoing a cash discount and paying at the end of the period?