

FIN 2704/2004 Finance Tutorial 10

Working Capital Management

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#1 :

Consider the following financial statement information for the Mediate Corporation:

Item	Beginning		Ending
Inventory	\$9,780		\$11,380
Accounts receivable	4,108		4,938
Accounts payable	7,636		7,927
Credit sales		\$89,804	
Cost of goods sold		56,384	

Calculate the operating and cash cycles. How do you interpret your answer?

The operating cycle is the inventory period plus the receivables period.

The inventory turnover is:

Inventory turnover = COGS/Average inventory

Inventory turnover = $\$56,384 / [(\$9,780 + 11,380) / 2] = 5.3293$ times

The inventory period is:

Inventory period = 365 days/Inventory turnover

Inventory period = $365 \text{ days} / 5.3293 = 68.49$ days

And the receivables turnover and receivables period are:

Receivables turnover = Credit sales/Average receivables

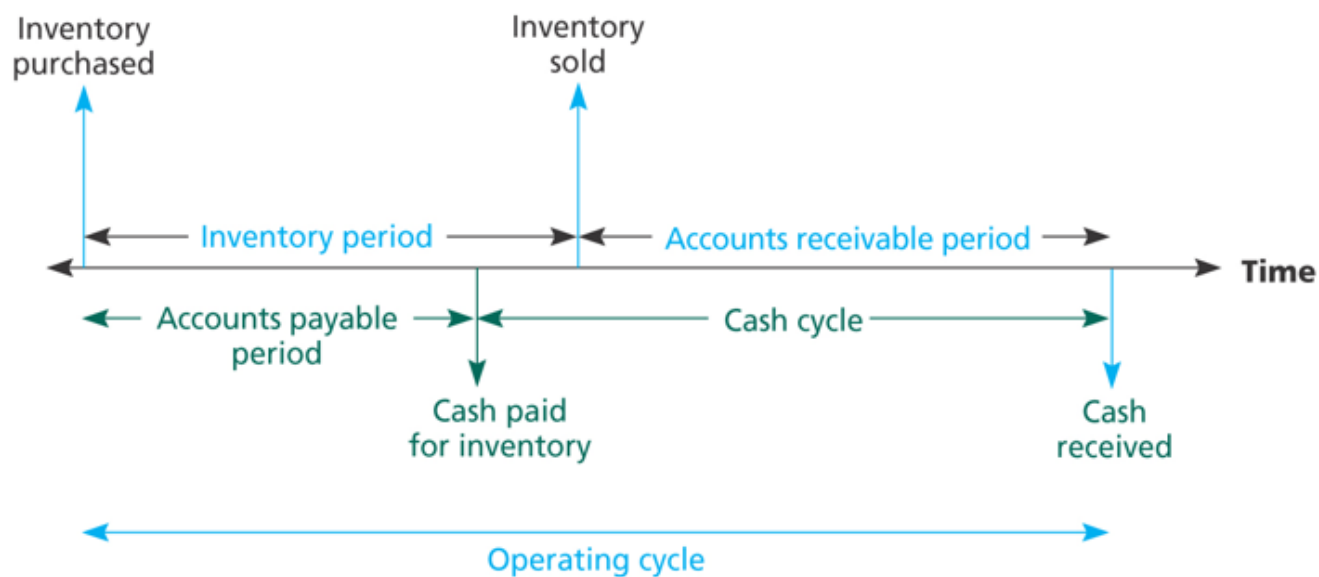
Receivables turnover = $\$89,804 / [(\$4,108 + 4,938) / 2] = 19.8550$ times

Receivables period = 365 days/Receivables turnover

Receivables period = $365 \text{ days} / 19.8550 = 18.38$ days

So, the operating cycle is:

Operating cycle = $68.49 \text{ days} + 18.38 \text{ days} = 86.87$ days



The cash cycle is the operating cycle minus the payables period.

The payables turnover and payables period are:

Payables turnover = $(EI + COGS - BI) / \text{Average payables}$

Payables turnover = $\$57,984 / [(\$7,636 + 7,927) / 2] = 7.452$ times

$EI = BI + \text{Purchase} - COG$

Payables period = $365 \text{ days} / \text{Payables turnover}$

Payables period = $365 \text{ days} / 7.452 = 48.98$ days

So, the cash cycle is:

Cash cycle = $86.87 \text{ days} - 48.98 \text{ days} = 37.89 \text{ days}$

The firm is receiving cash on average 37.89 days after it pays its bills.

#2:

You've worked out a line of credit arrangement that allows you to borrow up to \$50 million at any time. The interest rate is **0.64% per month**. In addition, 5% of the amount that you borrow must be deposited in a non-interest-bearing account. Assume that your bank uses compound interest on its line of credit loans.

- a. What is the **effective annual interest rate** on this lending arrangement?
- b. Suppose you **need \$15million today** and you repay it in six months. How much interest will you pay?

a. What is the effective annual interest rate on this lending arrangement?

If you borrow \$50,000,000 for one month, you will pay interest of:

$$\text{Interest} = \$50,000,000(0.0064) = \$320,000$$

However, with the compensating balance, you will only get the use of:

$$\text{Amount received} = \$50,000,000 - 50,000,000(0.05) = \$47,500,000$$

This means the periodic interest rate is:

$$\text{Effective periodic interest} = \$320,000 / \$47,500,000 = 0.006737 \text{ or } 0.674\%$$

So, the EAR is:

$$\text{EAR} = [1 + (\$320,000 / \$47,500,000)]^{12} - 1 = 0.0839 \text{ or } 8.39\%$$

- b. Suppose you need \$15million today and you repay it in six months. How much interest will you pay?

You need \$15,000,000, but because of compensating balance, you need to borrow more than \$15,000,000

$$\text{Amount to borrow} = \$15,000,000 / (1 - 0.05) = \$15,789,473.68$$

The total interest you will pay on the loan is:

$$\text{Total interest paid} = \$15,789,473.68(1.0064)^6 - 15,789,473.68 = 616,100.02$$

#3:

Each business day, on average, a company writes checks totaling \$14,000 to pay its suppliers. The usual clearing time for the checks is four days. Meanwhile, the company is receiving payments from its customers each day, in the form of checks, totaling \$26,000. The cash from the payments is available to the firm after two days. (Do not include the dollar signs (\$). Negative amounts should be indicated by a minus sign.)

- a. Calculate the company's disbursement float, collection float, and net float.
- b. How would your answer to part (a) change if the collected funds were available in one day instead of two?

- (a) The disbursement float is the average daily checks written times the average number of days for the checks to clear, so:

$$\text{Disbursement float} = 4(\$14,000) = \$56,000$$

The collection float is the average daily checks received times the average number of days for the checks to clear, so:

$$\text{Collection float} = 2(-\$26,000) = -\$52,000$$

The net float is the disbursement float plus the collection float, so:

$$\text{Net float} = \$56,000 - 52,000 = \$4,000$$

- (b) if the collected funds were available in one day instead of two, the new collection float will be:

$$\text{Collection float} = 1(-\$26,000) = -\$26,000$$

And the new net float will be:

$$\text{Net float} = \$56,000 - 26,000 = \$30,000$$

#4:

The Arizona Bay Corporation sells on credit terms of net 30. Its accounts are, on average, 8 days past due. If annual credit sales are \$8.4 million, what is the company's balance sheet amount in account receivable?

The average collection period is the net credit terms plus the days overdue, so:

$$\text{Average collection period} = 30 + 8 = 38 \text{ days}$$

The receivables turnover is 365 divided by the average collection period, so:

$$\text{Receivables turnover} = 365 / 38 = 9.6053 \text{ times}$$

And the average receivables are the credit sales divided by the receivables turnover so:

$$\text{Average receivables} = \$8,400,000 / 9.6053 = \$874,520.55$$

Alternatively, account receivable = credit sales per day x length of collection period.

#5:

A Firm offers terms of 1/10, net 35. What effective annual interest rate does the firm earn when a customer does not take the discount?

Without doing any calculations, explain what will happen to this effective rate if:

- a. This discount is changed to 2%.
- b. The credit period is increased to 60 days.
- c. The discount period is increased to 15 days.

The interest rate for the term of the discount is:

Interest rate = $0.01/0.99 = 0.0101$ or 1.01%

And the interest is for:

$35 - 10 = 25$ days. This is the number of days beyond the discount period

$m =$ the number of periods in a year or the compounding frequency

$= 365/25$

So, using the EAR equation, the effective annual interest rate (or the cost of trade credit to the customer is:

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

$EAR = (1.0101)^{365/25} - 1$

$EAR = 0.1580$ or 15.80% (This is the cost of trade credit when paid beyond the discount period)

$$\text{EAR} = \left(1 + \frac{\text{Discount}}{1 - \text{Discount}} \right)^{\frac{365}{(\text{credit period} - \text{discount period})}} - 1$$

A Firm offers terms of 1/10, net 35 ; extra day credit = 35-10

- (a) This discount is changed to 2%.
From the equation, EAR will increase
- (b) The credit period is increased to 60 days
From the equation, extra day credit will increase, EAR will decrease
- (c) The discount period is increased to 15 days.
From the equation, extra day credit will decrease, EAR will increase

#6:

The Harrington Corporation is considering a change in its cash-only policy. The new terms would be net one period. Based on the following information, determine if Harrington should proceed or not. The required return is 2.5 percent per period.

	Current Policy	New Policy
Price per unit	\$91	\$94
Cost per unit	\$47	\$47
Unit sales per month	3,850	3,940

The cash flow from either policy is:

$$\text{Cash flow} = (P - v)Q$$

So, the cash flows from the old policy = $(\$91 - 47)(3,850) = \$169,400$; and

The cash flow from the new policy = $(\$94 - 47)(3,940) = \$185,180$

So, the incremental cash flow would be:

$$\text{Incremental cash flow} = \$185,180 - 169,400 = \$15,780$$

The incremental cash flow is a perpetuity.

The cost of initiating the new policy is:

$$\text{Cost of new policy} = [PQ + v(Q' - Q)]$$

If $v \neq v'$

$$\text{the cost of new policy} = -[PQ + Q(v' - v) + v'(Q' - Q)]$$

So, the NPV of the decision to change credit policies is:

Opportunity cost

$$\text{NPV} = - [(\$91)(3,850) + (\$47)(3,940 - 3,850)] + \$15,780/.025 = \$276,620$$

Since NPV is positive, the firm should proceed.

#7:

- a. For Qn #6, what is the break-even quantity for the new credit policy?
- b. For Qn #6, what is the break-even price per unit that should be charged under the new credit policy assuming that the sales figure under the new policy is 4,100 units and all other values remain the same?

a.
The break-even quantity for the new credit policy

The cost of switching credit policies is:

$$\text{Cost of new policy} = -[PQ + v'(Q' - Q)]$$

And the cash flow from switching, which is a perpetuity, is:

$$\text{Cash flow from new policy} = [Q'(P' - v) - Q(P - v)]$$

To find the breakeven quantity sold for switching credit policies, we set the NPV equal to zero and solve for Q' .

Doing so, we find:

$$\text{NPV} = 0 = -[(\$91)(3,850) + (\$47)(Q' - 3,850)] + [(Q')(\$94 - 47) - (3,850)(\$91 - 47)]/.025$$

$$0 = -\$350,350 - \$47Q' + \$180,950 + \$1,880Q' - \$6,776,000$$

$$\$1,833Q' = \$6,945,400$$

$$Q' = 3,789.09 \approx 3,790 \text{ units}$$

b. What is the break-even price per unit that should be charged under the new credit policy assuming that the sales figure under the new policy is 4,100 units and all other values remain the same?

We can use the equation for the NPV we constructed in Part a.

Using the sales figure of 4,100 units and solving for P' , we get:

$$NPV = 0 = [-(\$91)(3,850) - (\$47)(4,100 - 3,850)] + [(P' - 47)(4,100) - (\$91 - 47)(3,850)] / .025$$

$$0 = -\$350,350 - 11,750 + \$164,000P' - 7,708,000 - 6,776,000$$

$$\$164,000P' = \$14,846,100$$

$$P' = \$90.53$$

Key Concepts

- **Working capital management** decides the level of each type of current asset to hold and how to finance them.
- **Operating cycle** : time between acquiring the inventory and collecting the cash.

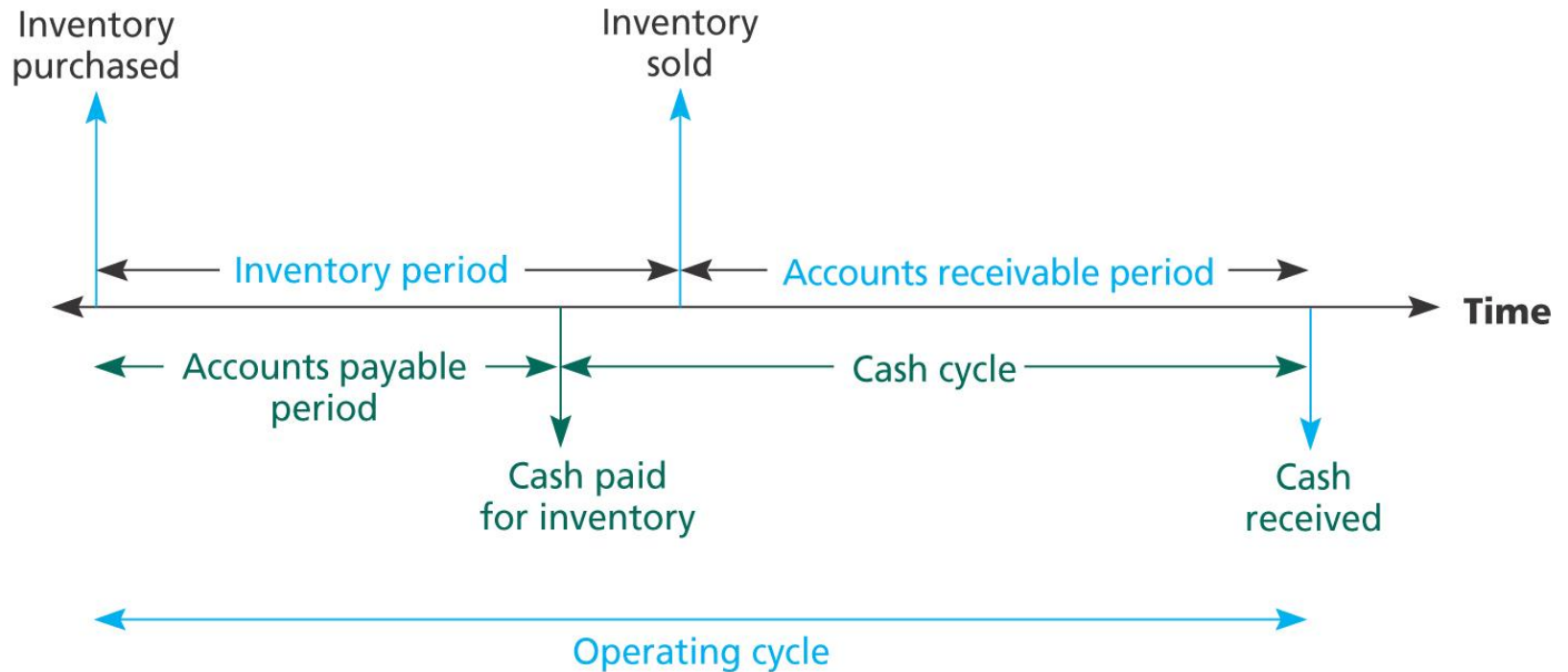
Operating cycle = inventory period + accounts receivable period

- **Inventory period** : time required to acquire and sell the inventory.
- **Accounts receivable period (DSO or ACP)** : time required to collect on credit sales.
- **Cash Conversion Cycle** : time between firm's payment for inventory and collection on its sales.

cash conversion cycle or cash cycle = operating cycle – accounts payable period

= inventory period + account receivable period – accounts payable period

The Operating & Cash Cycle



The operating cycle is the time period from inventory purchase until the receipt of cash. (The operating cycle may not include the time from placement of the order until arrival of the stock.) The cash cycle is the time period from when cash is paid out to when cash is received.

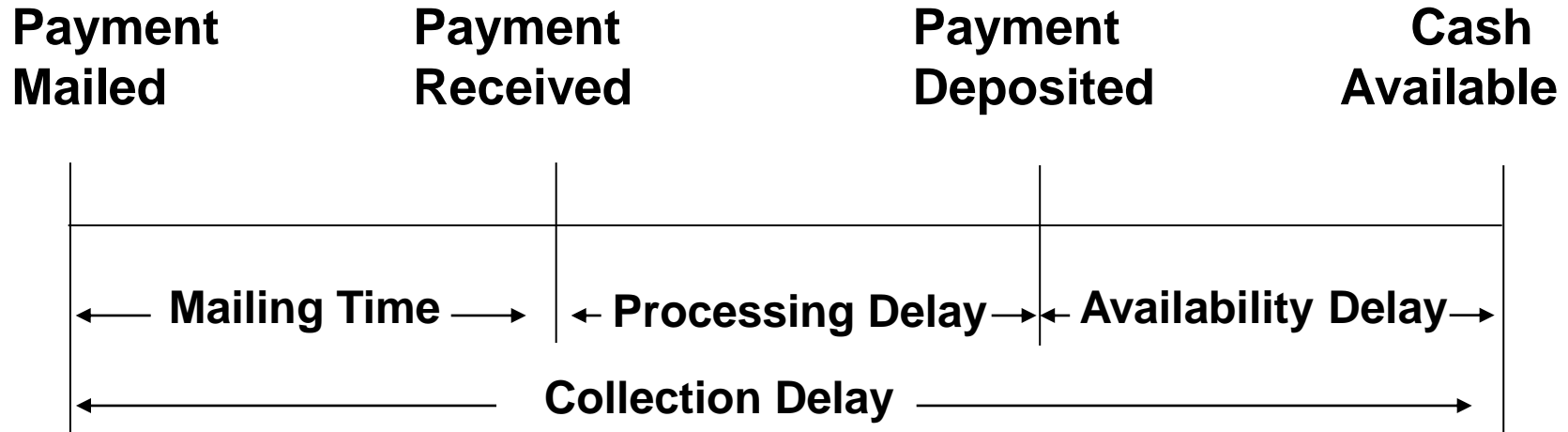
Key Concepts

- **A cash budget** is a weekly, monthly, or quarterly forecast of cash inflows and outflows.
- The budget indicates deficient or excessive cash balances, and financing plans are formulated based on it.
- **Float** is difference between available cash balance in the bank and the cash balance recorded in the books
- **Disbursement float** is generated when a firm writes cheques
 - ❖ Available Bank balance > book balance → Disbursement Float > 0
- **Collection float** occurs when the firm receives cheques
 - ❖ Available Bank balance < book balance → Collection Float < 0

Key Concepts

- Net float = Disbursement float + Collection float
- The net float at a point in time is simply the **overall** difference between the firm's available bank balance and its book balance. Positive net float will increase the available balance in the bank account.
- The net float is important when an account holder deal primarily in cheques. It is less important when an account deals primarily in direct deposits and debit cards.
- If the firm is efficient, it will have positive net float.
- Firm can make use of float. This will save on financing cost.

Managing Float



- Management concern = net float and available balance
- Collections and disbursement times
 1. Mailing time
 2. Processing delay
 3. Availability delay

← To speed collections, decrease one or more

← To slow disbursements, increase one or more

Lockbox System

- Customer checks mailed to a P.O box
- Local bank picks up cheques several times each day
 - Lockbox maintained by local bank
 - Cheques deposited to firm's account
- Firms may have many lockbox arrangements around the country
 - Funds end up in multiple accounts

Example: Lock Box

- A lockbox service has the following features. Should you accept the lockbox service?
 - Collection time reduction = 2 days
 - Daily interest rate on T-bills = 0.01%
 - Avg number of daily payments to lockbox = 5,000
 - Avg size per payment = \$500
 - Processing fee = \$0.10 per check + \$10 to wire funds to a centralized bank at the end of each day.

Benefits

Average daily collections = $\$5,000 * 500 = \2.5 mil

Increased bank balance = $2 * \$2.5 \text{ mil} = \5 mil

Costs

Daily cost = $\$0.1 * 5,000 + \$10 = \$510$

Present value of daily cost = $\$510 / 0.01\% = \5.1 mil

NPV = $\$5 \text{ mil} - \$5.1 \text{ mil} = -\$0.1 \text{ mil}$

The company should not accept this lock-box proposal

Key Concepts

Credit term includes (1) credit period and (2) discount given for early payment.

For example : 5/10 net 30

5 - percent discount for early payment

10 - number of days that the discount is available (discount period)

net 30 - number of days before payment is due (credit period)

DSO or ACP

= percentage of customers taking the discount x the discount period + the percentage of customers not taking the discount x the days until full payment is required.

Cost of Non-free Credit

- There are costs associated with having trade credit granted to your company by suppliers.
- The effective cost of what you purchase from the suppliers is often higher than if you were paying cash. Not only do you have to absorb the higher purchase price, but you have to figure in the actual cost of trade credit.
- The cost of trade credit, when paid during the discount period, is 0%
- Credit terms of 2/10 net 45 and \$500 loan
 - \$10 interest ($= 0.02 * 500$)
 - Period rate $= 10 / 490 = 2.0408\%$
 - Period $= (45 - 10) = 35$ days
 - $365 / 35 = 10.4286$ periods per year
- $\text{EAR} = (1.020408)^{10.4286} - 1 = 23.45\%$
- The company benefits when customers choose to forgo discounts