ARBA MINCH UNIVERSITY

FACULITY OF BUSINESS AND ECONOMICS

DEPARTMENT OF ACCOUNTING AND FINANCE

FINANCIAL MANAGEMENT II
(ACFN2102)

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PREFACE

The principal objective of modules on financial management is to help students acquainted with the concepts of financial management in the wealth maximization endeavor. Firms of different nature use basic concepts and theories of financial management in their wealth maximization trials.

Financial management is a two-semester course divided into part I and II as clearly depicted in the curriculum of Accounting and Finance Department of Arba Minch University. Accordingly, this module is concentrated on relevant concepts and theories of part II; but basically can be considered as continuation of part I. The module discusses and illustrates each component in most comprehensive and explanatory manner.

Under the module are five chapters, which are presumed important to achieve the expected learning objectives. The planning process and cash flow models, the valuation of capital assets, capital structure and cost of capital, investment decisions and capital budgeting, and the dividend policy decision are the chapters encompassed in the module.

After completion of financial management II, learners will be able to;

- Evaluate the value of sources of capital,
- Know the theories of capital structure,
- Compute cost of capital for each components of sources of capital,
- Examine processes and procedures in investment decisions,
- Identify and use different evaluating techniques for capital investment decisions,
- Know the theories of dividend policy decisions, and
- Identify relevant factors in the dividend policy decisions.
- Know the work of capitals and its components

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CHAPTER ONE

DIVIDEND POLICY AND THEORY

Introduction

Dear reader! Dividends refer to the portion of a firm's net earnings, which are paid out to the shareholders. Since preference shares are entitled to a stipulated rate of dividend, the major emphasis of dividend policy decision is concerned with the ordinary shareholders. The retained earning constitutes an easily accessible important source of financing for the investment fund requirement of firms. There is, thus, a type of inverse relationship between retained earnings and cash dividend: larger retentions, lesser dividends; smaller retentions, larger dividends. Thus, the alternative use of the net earnings – dividends and retained earnings- are competitive and conflicting.

A major decision of financial management is the dividend decision in the sense that the firm has to choose between distributing the profit to the shareholders and plough them back to the business. The choice would hinge on the effect of the decision on the maximization of shareholders' wealth. Given the objective of financial management of maximizing present values, the firm should be guided by the consideration as to which alternative use is consistent with the goal of wealth maximization. That is the firm would be well advised to use the net profits for paying dividends to the shareholders if the payment will lead to the maximization of wealth of the owners.

There are, however, conflicting opinions regarding the impact of dividends on the valuation of a firm. According to a school of thought, dividends are irrelevant so the amount of dividends paid has no effect on the valuation of the firm. On the other hand, certain theories consider the dividend decision as relevant to the value of the firm measured in terms of the market price of the shares.

This chapter, therefore, is designed to present and illustrate the theories and arguments of the two major schools of thought. Moreover, dividend types and determinant factors are described.

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1.1 Dividends- classification

1.2 Factors influencing dividend payments

1.3 Establishing dividend policy

1.3.1 Residual Dividend approach

1.3.2 Dividend stability

1.3.3 A Compromise

Chapter summary

Self-Test Activities

Objectives of the Chapter

This unit concentrates on presenting the meaning of dividend, its importance in corporate sector, the theories related to payment of dividend and factors that influence the dividend decisions.

After going through this unit, you will be able to:

i. Understand the meaning of dividend and their classification

ii. Explain the theories of dividend

iii. Distinguish between cash dividend and non-cash dividend, and

iv. List out the factor influencing the dividend decision.

1.1. Meanings of dividend and classifications

According to the Institute of Chartered Accountants of India, dividend is "a distribution to shareholders out of profits or reserves available for this purpose." The term dividend refers to that portion of profit (after tax) which is distributed among the owners / shareholders of the firm. In other words, dividend is that part of the net earnings of a corporation that is distributed to its stockholders. It is a payment made to the equity shareholders for their investment in the company

1.1.1. Dividends classification

The Classifications of dividends are based on the form in which they are paid. Following given below are the different types of dividends:

1. Cash dividend

Companies mostly pay dividends in cash. A Company should have enough cash in its bank account when cash dividends are declared. If it does not have enough bank balance, arrangement should be made to borrow funds. When the Company follows a stable dividend policy, it should prepare a cash budget for the coming period to indicate the necessary funds, which would be needed to meet the regular dividend payments of the company. It is relatively difficult to make cash planning in anticipation of dividend needs when an unstable policy is followed.

The cash account and the reserve account of a company will be reduced when the cash dividend is paid. Thus, both the total assets and net worth of the company are reduced when the cash dividend is distributed. The market price of the share drops in most cases by the amount of the cash dividend distributed.

2. Bonus Shares : (OR Stock -dividend in USA)

An issue of bonus share is the distribution of shares free of cost to the existing shareholders. Issuing bonus shares increases the number of outstanding shares of the company. The bonus shares are distributed proportionately to the existing shareholder. Hence, there is no dilution of ownership. The declaration of the bonus shares will increase the paid-up Share Capital and reduce the reserves and surplus retained earnings) of the company.

The total net-worth (paid up capital plus reserves and surplus) is not affected by the bonus issue. In fact, a bonus issue represents a recapitalization of reserves and surplus. It is merely an accounting transfer from reserves and surplus to paid up capital.

The following are advantages of the bonus shares to shareholders:

- **Tax benefit:** One of the advantages to shareholders in the receipt of bonus shares is the beneficial treatment of such dividends with regard to income taxes.

- **Indication of higher future profits:** shareholders normally interpret the issue of bonus shares as an indication of higher profitability.
- **Future dividends may increase:** If a Company has been following a policy of paying a fixed amount of dividend per share and continues it after the declaration of the bonus issue, the total cash dividend of the shareholders will increase in the future.
- **Psychological Value:** The declaration of the bonus issue may have a favorable psychological effect on shareholders. The receipt of bonus shares gives them a chance sell the shares to make capital gains without impairing their principal investment. They also associate it with the prosperity of the company.

3. Stock dividends

Dividends can be paid out in shares of stocks. This type of dividend is called stock dividend. A stock dividend is not a true dividend because it is not paid in cash. The effect of stock dividend is to increase the number of shares that each owner holds. It is commonly expressed as a percentage. For example, a 20 percent stock dividend means that a shareholder receives new share for every five share currently owned.

4. Share Splits

The stock split is not a form of dividend, but its effects are similar to the effects of bonus shares. A share split is a method to increase the number of outstanding shares through a proportional reduction in the par value of the share." A share split affects only the par value and the number of outstanding shares, the shareholders total fund remains unaltered. The main objectives are a) to make shares attractive b) to indicate higher future profits and c) to increase dividends. It is expressed in terms of ratio. For example, in a three-for-one stock split, each old share is split into three new shares.

5. Reverse Split

Under their situation of falling price of a company's share, the company may want to drop the market price per share. The reduction of the number of outstanding shares by increasing per share value is known as a reverse split. This is a less frequently encountered financial maneuver. For a one –for –three-reserve split, each investor exchanges three old shares for one new share. It has nothing-substantial effect for the company.

Given the real-world financial imperfection, three related reasons are cited for reserve splits. First, the transaction costs to shareholders may be less after the reserve split. Second, the liquidity and marketability of a company's stock might be improved when its price is raised to the popular trading range. Popular trading range is the price range between the highest and the lowest price at which a stock is traded. Third, stocks selling below a certain level are not considered respectable, meaning that investors understate the firm's earnings, cash flow, growth and stability.

6. Special dividend

In special circumstances, Company declares Special dividends. Generally, company declares special dividend in case of abnormal profits.

7. Extra dividend

An extra dividend is an additional non-recurring dividend paid over and above the regular dividends by the company. Companies with fluctuating earnings payout additional dividends when their earnings warrant it, rather than fighting to keep a higher quantity of regular dividends.

8. Regular cash dividends

Regular cash dividends are those the company exacts to maintain every year. They may be paid quarterly, monthly, semiannually or annually.

9. Scrip dividends

These are promises to make the payment of dividend later. The 'scrip' issued to stockholders is merely a special form of promissory note or notes payable

10. Liquidating dividends

These dividends are those, which reduce paid-in capital: It is a pro-rata distribution of cash or property to stockholders as part of the dissolution of a business

11. **Property dividends:** These dividends are payable in assets of the corporation other than cash. For example, a firm may distribute samples of its own product or shares in another company it owns to its stockholders.

1.2. Factors influencing dividend payment

From the above discussions, two schools (the irrelevance against relevance schools) of thoughts of dividend decisions tell us that dividends do not affect the market price of shares. But, there is lot evidence that many factors are influencing the value of shares in the stock exchange. Therefore, there is need to know the factors which affect the dividend policy of a firm.

Stage of growth of the company

When a company is in a growing stage with profitable and acceptable investment opportunities promising higher rates of return than what shareholders could earn outside the company prefers to retain the major portion of earnings, otherwise there is no reason to withhold the earnings. It is clear that during the development stage. Companies resort for lower rate of dividend and higher amount of retained earnings.

Stability of Earnings: If a company is earning consistently stable earnings, it will be able to pay higher dividend than an enterprise with fluctuating earnings. The stability or otherwise depends upon the nature of business.

A company, which is sure of future earnings can pay higher dividend, but a company with fluctuating earnings should retain a major portion of its earnings in order to maintain its position during the years of insufficient or low profits.

Economic Conditions: The general state of economy largely affects the management's decision to retain or distribute earnings of the firm. In uncertain economic conditions, management prefers to retain earnings rather than distribution. Similarly, during depression funds are withheld to preserve company's liquidity position. In the periods of boom and prosperity, the management will not pay dividends, though the largeness of the earnings warrants it, because of the availability of larger profitable investment opportunity.

Liquidity: As you know that payment of dividends involve cash payment. When there is cash outflow, naturally the liquidity position of the company is impaired. Though a company has sufficient profits, it may not be in a position to pay dividends as it results in decrease of cash resources. If the company is in growing stage, it requires huge investments in fixed and working capital. Then the company may not find it viable to pay larger dividends.

Company's Ability to Borrow: A well-established organization with sound credibility in the market will have easy access to capital market and will not have any difficulty in the matter of borrowing from external sources. The greater the ability of the firm to borrow, the greater is its flexibility and its ability to pay cash dividends or to finance its investment opportunities.

Tax Liability of Shareholders: In a closely held corporation, if the tax liability of the shareholders is high in a particular year, they prefer to retain the profit in the company itself. Whenever the tax liability is low, they prefer to have higher rate of dividend.

The Interest Liability of the Company: You have already seen that the cost of debt capital is cheaper than cost of equity capital. The interest on debt is tax exempted i.e., before tax. However, the dividend payable is after tax. However, debt capital has its own disadvantages when the company is not performing well. In such a case, it is better to redeem the debt to get rid off from the interest payment obligation. Naturally, this kind of situation is going to influence the dividend decision.

Market Conditions: The way the stock market would probably respond to various types of dividend. Dividend policies affect the dividend decisions. Shareholders are generally believed to prefer an increasing or at least constant fixed level of dividends and resent the decline in the dividends per share. Similarly, the stock market gives importance not only to a fixed or increasing level of dividend but also to a policy of continuous dividend payment. The skipping of dividends may lead to fall in the price of the share. Shareholders also view the firm's dividend payments as an indicator of future success. Thus, the stock market looks at the firm's dividend as a source of information.

Legal, Contractual and Internal Constraints: The contract between the company and its creditors or between the company and its preference shareholders may include restraints on the firm's freedom to declare dividends and other activities for the protection of lender's or preference shareholders investment. For example, term lending institutions in sanctioning the loan to a new sick company may restrict the amount of dividends (such as 6% or 10%) which could be paid to its shareholders. This is to ensure the recovery of loan as well as to prevent possible declining of funds. Preference stock contracts, which provide cumulative dividends to preference shareholders, stipulate that there will be no dividend payment to equity shareholders until current and all unpaid preference dividends have been paid.

Some laws provide that dividends in the form of cash or property may not exceed retained earnings (accumulated profits) plus surplus. That is the company may not pay dividends if the owner's equity (Assets minus liability) is no greater than the outstanding stock's total par (legal) value. The requirement is imposed to ensure that the assets of the firm exceed liabilities by a minimum cushion in order to protect the lenders.

The firm's ability to pay dividends is generally limited by the amount of extra cash available. Of course, a firm may borrow cash and then pay dividend. However, in that case it is likely that the minimum dividends will be paid.

1.3. Establishing dividend policy

Irrelevance of Dividends

The crux of the argument supporting the irrelevance of dividends to valuation is the dividend policy of a firm is part of its financing decision. As part of the financing decision, the dividend policy of the firm is a residual decision and dividends are a passive residual.

If dividend policy is strictly a financing decision, whether dividends are paid out of profits or earnings are retained, will depend upon the available investment opportunities. It implies that when a firm has sufficient investment opportunities, it will retain the earnings to finance them. Conversely, if acceptable investment opportunities are inadequate, the implication is that the earnings would be distributed to the shareholders. The test of adequate, acceptable investment opportunities is the relationship between the return on investment and the cost of capital. As long as the return on investment is greater than the cost of capital a firm has acceptable investment opportunities. In other words, if a firm can earn a return higher than its cost of capital, it will retain the earnings to finance investment projects. If, however, the retained earning exceeds the requirement of funds to finance acceptable investment opportunities, the excess earning would be distributed to the shareholders in the form of cash dividends. The amount of dividend will fluctuate from year to year depending upon the availability of acceptable investment opportunities.

The theory of dividends are irrelevant is based on the investors are indifferent between dividends and capital gains. So long as the firm is able to earn more than the equity capitalization rate, the investors would be content with the firm retaining the earnings. In

contrast, if the return is less than the capitalization rate, the investors would prefer to receive the earnings, i.e. the dividends.

The most comprehensive argument in support of the irrelevance of dividends is provided by the Miller and Modigliani (MM) hypothesis. MM maintains that dividend policy has no effect on the share price of the firm, and is therefore, of no consequence. What matters, according to them, is the investment policy through which the firm can increase its earning and thereby the value of the firm. Given the investment decision of the firm, the dividend decision - splitting the earnings into packages of retention and dividends – is a matter of detail and does not matter. Under the condition of perfect capital markets, rational investors, absences of tax discrimination between dividend income and capital appreciation, given the firm's investment policy, its dividend policy may have no influence on the market price of shares.

Assumptions of MM approach

The MM hypothesis of irrelevant of dividends is based on the following critical assumptions:

1. Perfect capital market in which all investors are rational. Information is available to all free of cost, there are no transaction costs; securities are infinitely divisible; no investor is large enough to influence the market price of securities; there are no floatation costs.
2. There are no taxes. Alternatively, there are no differences in tax rates applicable to capital gains and dividends.
3. A firm has a given investment policy which does not change. The operational implication of this assumption is that financing of new investment out of its retained earning will not change the business risk complexion of the firm and, therefore, there would be no change in the required rate of return.
4. There is no perfect certainty to every investor as to future investment and profit of the firm. In other words, investors are able to forecast future prices and dividends with certainty, which actually is dropped by M&M themselves later times.

The Root Argument of MM Approach

The crux of the MM position on the irrelevance of dividend is the arbitrage argument. The arbitrage process involves a switching and balancing operation. In other worlds, arbitrage

refers to entering simultaneously into two transactions which exactly balance or perfectly offset each other. The two transactions here are the acts of paying out dividends and raising external funds – through the sale of new shares or raising additional loans- to finance investment program. Assume that a firm has investment opportunities and has a given investment decision, the firm has two alternatives: 1) it can retain its earnings to finance the investment program; 2) or distribute the earning to the shareholders as dividends and raise an equal amount externally through the sale of new shares/ bonds for the purpose. If the firm selects the second alternatives, arbitrage process is involved; the payment of dividends is associated with raising funds through other means of financing. The effect of dividend payment on shareholders' wealth will be exactly offset of raising additional share capital.

When dividends are paid to the shareholders, the market price of the shares will decrease. What is gained by the investors as a result of increased dividends will be neutralized completely by the reduction in the terminal value of the shares. The market price before and after the payment of dividend would be identical. The investors, according to MM, would, be indifferent between dividend and retention of earnings. Since the shareholders are indifferent, the wealth would not be affected by current and future dividend decisions of the firm. It would depend entirely upon the firm.

There would be no difference to the validity of the MM premises, if external funds are raised in the form of debt or equity capital. This is because of their indifference between debt and equity with respect to leverage. The cost of capital is independent of leverage and the real cost of debt is the same as the real cost of equity.

The issue that investors are indifferent between dividend and retained earnings implies that the dividend decision is irrelevant. The arbitrage process also implies that the total market value plus current dividend of two firms which are alike in all respects except dividend payout ratio will be identical. The individual shareholders can retain and invest their own earnings as well as the firm would.

With dividends being irrelevant, a firm's cost of capital would be independent of its dividend pay out ratio. Finally, the arbitrage process will ensure that under the conditions of **uncertainty** also the dividend policy would be irrelevant. When two firms are similar in respect of business risk, prospective future earnings and investment policies, the market price of their shares must

be the same. This MM argument is because of rational behavior of investors who are assumed to prefer more wealth to less wealth.

Critique on the MM hypothesis

Whether the MM hypothesis provides a satisfactory framework for the theoretical relationship between dividend decision and valuation will depend, in the ultimate analysis, on whether external and internal financing really balance each other. This in turn depends upon the critical assumption stipulated by them. Their conclusions are logically consistent and intuitively appealing. But these assumptions are unrealistic and untenable in practice. As a result the conclusion that dividend payments and other methods of financing exactly offset each other and, hence, the irrelevance of dividend is not a practical position; it is merely of theoretical relevance. The validity of MM approach is open to questions on two counts: 1) Imperfection of capital markets; 2) Resolution of uncertainty.

Imperfection of capital markets: Miller and Modigliani assume that capital markets are perfect. This implies that there are no taxes; flotation costs do not exist and there is absence of transaction costs. These assumptions are untenable in actual situations.

Resolution of uncertainty: Apart from market information, the validity of the MM hypothesis, insofar as it argues that dividends are irrelevant, is questionable under condition of uncertainty. MM holds that dividend policy is as irrelevant under conditions of uncertainty as it is when perfect certainty assumed. It is not tenable as investors cannot be indifferent between dividend and retained earnings under condition of uncertainty.

This can be say due to;

1. Near against distant dividend
2. Information content of dividends
3. Preference for current income
4. Sale of stock under uncertain price/ underpricing.

Relevance of Dividends

In sharp contrast to the MM hypothesis, there are some theories that consider dividend decisions to be an active variable in determining the value of the firm.

Walter's Model

Walter's model supports the doctrine that dividends are relevant. The investment policy of a firm cannot be separated from its dividend policy and both are interlinked. The choice of an appropriate policy affects the value of the firm.

The key argument in support of the relevant proposition of Walter's model is the relationship between the return of the firm's investment or its internal rate of return and its cost of capital or the required rate of return. The firm would have to have an optimal dividend policy, which will be determined by the relationship of internal rate of return and required rate of return. In other words, if the return on investments exceeds the cost of capital, the firm should retain the earnings; whereas it should distribute the earnings to the shareholders in case the required rate of return exceed the expected return on the firm's investments. The rationale is that if the internal rate of return is greater than the required rate of return, the firm is able to earn more than what the shareholders could by reinvesting, if the earnings are given to them. The implication of internal rate of return less than the required rate of return is that shareholders can earn a higher return by investing elsewhere.

Walter's model, thus, relates the distribution of dividends (retention of earnings) to available investment opportunities. If a firm has adequate profitable investment opportunities, it will be able to earn more than what the investors expect. Such firms may be called growth firms. A dividend pay out ratio of zero would give the optimum dividend policy. That is to say the firm should plough back the entire earnings within the firm. The market value of shares will be maximized as a result.

In contrast if the firm does not have profitable investment opportunities, where internal rate of return is less than the required rate of return, the shareholders will be better off as far as earnings are paid out so as to enable them earn a higher return by using the funds elsewhere. In such a case, the market price of shares will be maximized by the distribution of the entire

earnings as dividends. A dividend payout ratio of 100 percent would give an optimum dividends policy.

Finally, when the internal rate of return is equal to the required rate of return, it is a matter of indifference whether earnings are retained or distributed. This is so because for all dividend payout ratios, ranging between zero and 100, the market price of share will remain constant. For such firms, there is no optimum dividend policy or dividend pay out ratio.

Assumptions of Walter's Model

The main assumptions of the Walter Model are as follows:

1. All financing is done through retained earnings; external sources of funds like debt or new equity capital are not used.
2. With additional investments undertaken, the firm's business risk does not change. It implies that internal rate of return and required rate of return are constant.
3. There is no change in the key variables, namely, beginning earnings per share, and dividend per share. The value of dividend per share and earning per share may be changed in the model to determine the result, but any given value of earning per share and dividend per share are assumed to remain constant in determining the given value.
4. The firm has perpetual or very long life.

Critiques on Walter's Model

Some of the assumptions do not stand critical evaluation.

In the first place, the Walter's model assumes that exclusively retained earnings finance the firm's investments; no external financing is used. The model would be only applicable to all-equity firms.

Secondly, the model assumes internal rate of return is constant. This is no a realistic assumption because when additional investments are made by the firm, internal rate of return also changes.

Finally, as regards the assumption of constant cost of equity capital or required rate of return, the risk complexion of the firm has a direct bearing on it. By assuming, a constant cost of equity capital, Walter's model ignores the effect of risk on the value of the firm.

Gordon's Model

Gordon's Model is also in favor of the relevance of dividends. This model, which discourse that dividend policy of a firm affects its value, is based on the following assumptions:

1. The firm is an all-equity firm. No external financing is used and investment programs are financed exclusively by retained earnings
2. Internal rate of return and cost of equity capital are constant
3. The firm has perpetual life
4. The retention ratio, once decided upon, is constant. Thus, the growth rate is also constant.
5. Cost of equity capital is greater than the growth rate.

It can be seen from the assumptions of Gordon's model that they are similar to those of Walter's model. As a result, Gordon's model, like Walter's model, contends that dividend policy of the firm is relevant and that investors put a positive premium on current incomes that is dividends. The crux of Gordon's assumptions is a two-fold assumption: 1) investors are risk averse, and 2) they put premium on *certain* return and discount/ penalize *uncertain* returns.

All investors are rational so that they want to avoid risk. The term risk refers to possibility of not getting a return on investment. The payment of current dividends assumes to remove the chance of risk. If, however, the firm retains earnings the investors can expect to get a return in the future. The future dividend is uncertain, both with respect to the amount as well as with respect to the timing. The rational investor can reasonably be expected to prefer current dividend. The investors evaluate the retained earnings as a risky premise. In case the earnings are retained; therefore, the market price of the shares would be adversely affected.

The above argument underlying the Gordon's model of dividend relevance is also described as *a bird –in-the-hand argument.* That *a bird in a hand is better than two in the bus**h*** is based on the logic what is available at present is preferable to what may be available in the future.

QUICK CHECK

1. What are the basic differences for Walter's Model and Gordon's Model of dividend policy decision?
2. Mention two critiques on MM hypothesis

1.3.1. Residual Dividend Approach

The most prominent dividend policy based on the internal financing, which is cheaper than external financing, is the "Residual Dividend Policy." Funds for corporate investment come from borrowing, retained earnings and sale of shares. Retained earnings and sale of securities form equity investment. In each period, management determines the proportion of new investments to be financed by borrowing and by equity. The desired proportions depend on financial market conditions and on target debt level set by management. The dividend under a residual dividend policy equals the amount left over from earnings after internal financing.

Dividend Policy

You are aware that dividend is a portion of earnings that is payable to the shareholders. Normally, the directors will declare in the annual general meeting of the company. Dividends represent a distribution of the book surplus accompanied by a distribution of assets or by a change in the form of equities or an increase in the liabilities of the corporation. For some, the rate of dividend is the amount of distributed profit as percentage of the nominal value of the share capital to which it relates.

The dividend policy of the company includes all aspects of dividend payout such as percentage of payment, retained earnings, stability of earnings, timing of dividend payments, methods of payment, cash, bonus shares etc. The dividend policy should be determined in terms of its impact on the shareholders earnings. The ideal dividend policy is one, which maximizes the market value per share.

1.3.2. Dividend stability

As you already have observed every shareholder of any company expects return over the investment in the form of dividend. Factors that will affect dividends have been discussed. These factors were considered, would ensure the stability of dividends. Stability of dividends means a sort of consistency in the payment of dividends. It is a regular payment of certain amounts as dividends. It is believed that if a company pays out the relatively stable dividend over a longer period, the market price of the share will be relatively higher than that of the shares of a company whose dividends have been fluctuating every year.

The stability could be in the following forms:

Constant Dividend per Share: Whenever a company pays a fixed amount of dividend per share every year it is called constant dividend. For example, a company pays $3 per share having a face value of $10. This amount is paid irrespective of the level of earnings of the company year after year.

Constant Percentage: Sometimes the companies may pay dividend as a percentage of the face value of the share.

Stable Dividend plus Extra Dividend: Under this method, the corporation usually pays a fixed dividend per share to the shareholders. However, in the years of prosperity additional or extra dividend is paid over and above the regular dividend. This extra dividend is frozen as soon as normal condition returns.

QUICK CHECK

1. The company's ability to borrow affects the dividend decision of a company. Explain
2. Explain the difference between share split and reserve split.
3. Stock dividend worth less compared to cash dividend. Discuss.

Dividend payment procedures

Cash dividend refers to the portion of net income paid out to shareholders in cash. The dividend payment procedures of a company can be described as under:

1. **Declaration date**

   The date at which board of directors meet and issue a statement declaring dividend is called declaration date. The board of directors set the amount of dividend to be paid, the holder - of - record date and the payment date on this date. Generally, dividend is announced as a percentage of the per value of stock. However, it can be the absolute amount like Rs 5 per share in some cases.

2. **Holder - of - record date**

   The date on which the company opens the ownership books to make a list of shareholders who are entitled to receive the dividend is called holder - of - record date. All the stockholders of the record date are entitled to receive the dividend declared by the board of directors. The new stockholders would receive dividend if the name of shareholders is recorded in the ownership book on or before the date of record. However, if the notification about the transfer was received after the date of record, the old owner of the stock would receive the dividends.

3. **Ex - dividend date**

   Ex-dividend date is two business days prior to the record date. Shares purchased after the ex-dividend date are not entitled to the dividend. The transaction must take place before the ex-dividend date to entitle the new holder to receive dividend. Thus, the date when the right to the dividend leaves the stock for new owner is called ex-dividend date.

4. **Payment date**

   The date on which the company actually pays dividends or mails the cheques to the stockholders is called payment date. On this date, the company actually pays the dividend to all the stockholders of the date of record.

Example

On July 31, 2009, Khushi Company Limited declared a dividend of Rs 5 per share, payable on October 1 to the holders of record on September 1. Show the Khushi's dividend payment procedure.

Solution

1. Declaration date: July 31, 2009 on which Khushi Company's board of directors declared a dividend of Rs 5 per share.
2. Holder - of - record date: September 1, 2009 on which company makes a list of shareholders who are entitled to receive dividend.
3. Ex-dividend date: August 30, 2009 after which dividends are entitled with the seller of the stock.
4. Payment date : October 1, 2009 on which Khushi Company mails the cheque of dividends to the shareholder

1.3.3. A Compromise dividend policy

A compromise dividend policy is suggested, where:

a. Maintain a LT target payout ratio
b. Pursue profitable investment w/ $ retained after dividend payments from NI.
c. Keep dividend payout stable/increasing.
d. Avoid new capital issues due to overly generous dividend policy (growing vs. stable firm?)
e. Try to maintain an optimal capital structure and target D/E ratios.

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Summary

The recapitulation of the two schools of thoughts relating to the dividend policy and its effect on the value of the firm varies. One view, presented by Walter and Gordon the dividend is relevant and it certainly affects the market price of shares. The other view, led by Miller and Modigliani takes a diametrically opposite position and argues that dividends are a passive residual, solely by the available investment opportunities. According to this view, dividend is a method of distributing funds which the firm cannot use profitably. The arguments in support of this line of reasoning do not stand the test of scrutiny under the actual situations, namely, imperfection in the capital market and also reveal that investors seem to prefer current dividend over retained earnings. It should, therefore, be conceded that dividend policy is relevant. A firm should try to follow an optimum dividend policy, defined as the one which maximizes the shareholders wealth in the long run.

The earnings after dividends have been paid become retained earnings. Retained earnings are source of long term financing, the dividend decision can also be considered as financing decision. The dividend decision is made by the company's board of directors. The amount or percentage has to be set by the board. The factors affecting dividend decisions are growth and expansion of the firm, stability of earnings, economy, liquidity, ability to borrow, tax position of shareholders and company, interest charge payment, legal constraints etc.

Self-Test Exercises

Multiple choice Questions

1. The relationship between retained earning and cash dividend is_____

    a) progressive

    b) Regressive

    c) Inverse

    d) Same direction

2. According to the school of thought which favors the irrelevance of dividend for firms value

    a) Dividend policy of a firm is part of firm's financing decision

    b) Dividend policy is a residual decision

    c) Dividends are passively decided

    d) All

    e) none

3. The theory of irrelevant dividend policy decision is based on

    a) Investors are pessimists about retained earnings

    b) Investors are indifferent between dividend and capital gains

    c) Investors are totally disregarded

    d) Maximization of profit for the firm

    e) None

4. One of the following theorizes the relevance of dividend for firms valuation process

    a) Walter

    b) Gordon

    c) Miller and Modigliani

    d) a &b

e) b &c

5. _____is the process which involves a switching and balancing operation

   a) Arbitrage

   b) Retention

   c) Dividend

   d) Capital market imperfection

   e) None

6. Walter's Model is criticized on

   a) The assumption of no external financing is needed

   b) The assumption that internal rate of return is constant

   c) It disregards the effect of risk on the value of the firm

   d) All

   e) None

7. The dividend policy of a firm includes all, but

   a) Percentage of payment

   b) Timing of dividend

   c) Methods of payment

   d) Retained earnings

   e) All

8. Which one of the following affect dividend decision

   a) Growth and expansion

   b) Legal constraints

   c) Stability of earnings

   d) All of the above

9. Residual dividend policy is concerned with

    a) Extra financing

    b) Long term financing

    c) Internal financing

    d) Short term financing

10. _____ is to increase the number of shares that each owner holds

    a) Bonus Shares

    b) Reserve split

    c) Stock dividend

    d) Cash dividend

    e) None

CHAPTER TWO

PRINCIPLES OF WORKING CAPITAL MANAGEMENT

Dear reader! Welcome the fifth chapter of the module. Dear! Would you please refer to chapter one of the module! The chapter under the three major investment decisions has highlighted you about the investment decisions in which capital budgeting and working capital are subsections. There you have read that working capital management is the management of current assets. This chapter is designed with very extensive details so that you will be able to expand your knowledge of that introductory sub-section.

Chapter Outline

2.1. The concept of working capital

2.2. Operating and cash conversion cycle

2.3. Permanent and Variable Working Capital

2.4. Determinants of working capital management

2.5. Financing Current Assets

Chapter Summary

Self-Test Activities

Chapter Objectives

At the completion of the chapter, you will be able to

- Understand basic concepts of working capital.
- Identify the reasons for maintaining working capital.
- Identify factors that determine the amount of working capital need.
- Know how firms finance their current assets.
- Make estimation for required balance of working capital to be kept in organizations.

2.1. The concept of working capital

Working capital management is concerned with management of current assets and current liabilities, and the interrelationship that exists between these two groups. The term current assets refer to those assets, which in the ordinary course of business will be converted into cash, usually within one year. The conversion should be without undergoing a reduction in value and without disrupting the operations of the firm. Current liabilities are those liabilities, which are intended to be paid in the ordinary course of business, usually within a year. The payment is to be made out of the current assets or earnings of the firm. The current asset section may include cash and bank balances, marketable securities, account receivables, notes receivables and inventories among others. The current liabilities include short-term borrowings, account payables, notes payables, tax payables, interest payables, etc.

In the management of working capital, two characteristics of current assets are areas of concern. The first is that current assets have short life span and secondly, they do have nature of swift transformation into other asset forms. Cash balances may be held idle for a week or two, accounts receivables may have a life span of 30 to 60 days, and inventories may be held for 30 to 100 days. The life span of current assets depends upon the time required in the activities of procurement, production, sales and collection and degree of coincide among them. Each current asset is swiftly transformed into another asset forms. For example, cash may be used for acquiring raw material; raw material are transformed into finished goods; finished goods, if sold on credit, are converted into accounts receivables; and finally accounts receivables, on the collection date are converted into cash.

The goal of the working capital management, as it is stated above, is to manage the firm's current assets and liabilities in such a way that a satisfactory level of working capital is maintained. This is because if the firm cannot maintain a satisfactory level of working capital, it is likely to become insolvent and may even be forced into bankruptcy. The current assets should be large enough to cover its current liabilities in order to ensure a reasonably margin of safety. Each of the current assets must be managed efficiently in order to maintain the liquidity of the firm while not keeping too high a level of any one of them. Each of the short-term sources of financing must be continuously managed to ensure that they are obtained and

used in the best possible way. *The interaction between current assets and current liabilities is, therefore, the main theme of the theory of working management.*

There are two concepts of working capital. The concept lies on gross working capital and net working capital. The term gross working capital is the total current assets of a firm**.**

Gross working capital = Total Current+ Assets

The term net working capital can be defined in two ways. In the first place it is the difference between current assets and current liabilities; and alternatively, it can be the portion of current assets which is financed with long-term funds.

Net working capital = Current assets – Current liabilities

Net working capital is commonly defined as the difference between current assets and current liabilities. This definition is considered as the measure of liquidity by analysts. The theoretical justification the liquidity measure is based on the fact that the greater the margin by which the current assets cover the short-term obligations, the more is the ability to pay obligations when they become due for payment. The net working capital is necessary because the cash outflows and inflows do not coincide.

Net working capital can alternatively be defined as that part of the current assets which are financed with long-term funds. Since current liabilities represent sources of short-term funds, as long as current assets exceed the current liabilities, the excess must be finance with long-term funds.

2.2. Operating and cash conversion cycle

Given the objective of financial decision making to maximize the shareholders' wealth, it is necessary to generate sufficient profits. The extent to which profits can be earned will naturally depend, among other things, upon the size of sales. A successful sales program is, in other words, necessary for earning profits by any business enterprise. However, sales do not convert into cash instantly; there is invariably a **time-lag** between the sale of goods and the receipt of cash. There is, therefore, a need for working capital in the form of current assets to deal with the problem arising out of the lack of immediate realization of cash against goods sold. This is to imply that sufficient working capital is necessary to sustain sales activity.

The time lag is technically referred to as the operating cycle or cash cycle. The operating cycle, particularly when matched with cash cycle, can be said as the heart of the need for working capital. The cash cycle is a period of continual flow from cash to suppliers, to inventory, to accounts receivable and back into cash.

Operating cycle = Inventory period + Accounts receivable period

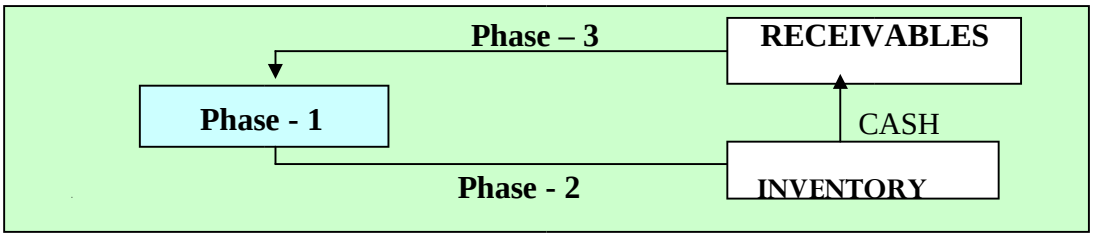


Figure 2.1 Operating cycle (Khan and Jain, 2000)

The operating cycle consist of three phases. In the phase-1, cash gets converted into inventory. This includes purchase of raw materials, conversion of raw material into work-in progress, finished goods and finally the transfer of goods to stock at the end of the manufacturing process. In the case of trading organizations, this phase is shorter as there would be no manufacturing activity and cash is directly converted into inventory. The phase is of course, totally absent in the case of service organization.

In phase – 2 of the cycle, inventory is converted into receivables as credit sales are made to customers. Firms, which do not sell on credit, obviously not have phase – 2 of the Cash cycle.

The last phase, phase – 3, represents the stage for the collection of receivable. This phase completes the operating/cash cycle. Thus, the firm has moved from the cash to inventory, to receivables and to cash again, which is in a continuous fashion.

Recall from the above facts that the operating cycle creates the need for the current assets. It is not also come to an end after the cycle is completed. It continues to exist. To explain this continuing need of current assets (working capital) a distinction should be drawn between permanent and temporary working capital.

Cash cycle: The time between cash disbursement and cash collection. The cash cycle, therefore, is the number of days that pass before we collect the cash from a sale, measured

from when we actually pay for the inventory. Notice that based on our definitions, the cash cycle is the difference between the operating cycle and the accounts payable period:

Cash cycle = Operating cycle - Accounts payable period

2.3. **Permanent and Variable Working Capital**

To carry on business, a certain minimum level of working capital is necessary on a continuous and uninterrupted basis**.** For all practical purposes, this requirement has to be met permanently as with other fixed assets. This requirement is referred to as permanent or fixed working capital.

Any amount over and above the permanent level of working capital is temporary, fluctuating or variable working capital. The position of the required working capital is needed to meet fluctuations in demand resulted from changes in production and sales, which in turn is a result of seasonal changes. The basic distinction between permanent and temporary working capital is illustrate in the figure 2.2.

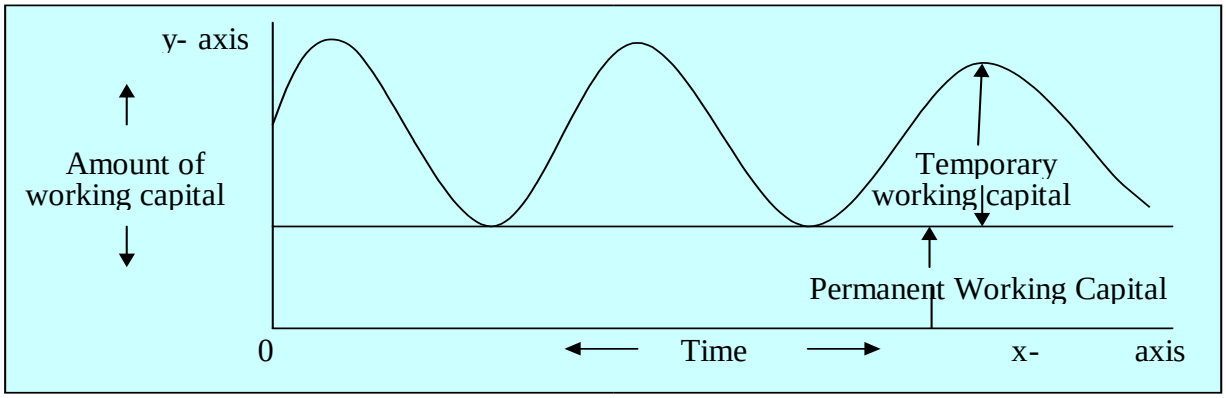


Figure 2.2 Permanent and Temporary Working Capital (ibid)

Figure 2.2 shows that the permanent level is constant, while temporary working capital is fluctuating – increasing or decreasing in accordance with seasonal demands. In the case of an expanding firm, the permanent working capital line may not be horizontal. This is because the demand for permanent current assets might be increasing to support a rising level of activity. In that case the line would be a rising one as shown in Figure 2.3

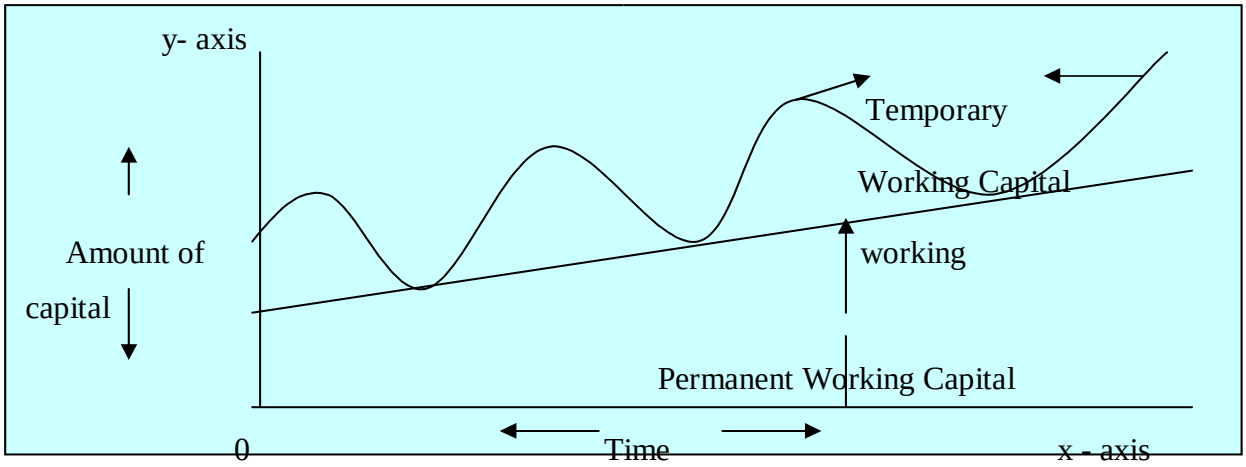


Figure 2.3 Permanent and Temporary Working Capital (ibid)

Quick Check

1.Differentiate gross working capital and net working capital.

2.What is a cash cycle and how it affects need for working capital?

3.Explain the difference between permanent and temporary working capital.

2.4. Determinants of working capital management

The total working capital requirement is determined by a wide variety of factors. These factors affect different firms differently and they may be time dependent. According to Khan and Jain (2000) the following factors could be assessed in determining the amount of working capital.

General Nature of the Business Enterprises fall into some broad categories depending on the nature of their business activities and the amount of working capital varies from group to the other.

a) Public services (utilities) have certain features, which would have a bearing on their working capital needs. Their features include; the cash nature of the business that is cash sales; and sales of services rather than commodities or inventories so that they probably have least requirement for working capital.

b) Trading and financing enterprises-, the nature of these businesses is to maintain a sufficient amount of cash, inventory and receivables. They have to proportionately invest large amount in working capital.

c) Manufacturing enterprises-usually fall between the above two extremes of cases.

Production Cycle Production cycle is to mean the time involved in the manufacture of goods. It covers the time elapsed between the procurement of raw materials and the completion of the manufacturing process leading to the production of finished goods. Funds have to be necessarily tied up during the process of manufacture, necessitating enhanced working capital. In other words, there is some time gap before raw materials become finished goods. To sustain such activities the need for working capital is obvious. The longer the time-span (i.e. the production cycle), the larger will be the tied-up funds and, therefore, the larger is the working capital needed and vice versa. There are enterprises which, due to the nature of business, have a short operating cycle. A distillery, which has an ageing process, has generally to make a relatively heavy investment in inventory. The other extreme is provided by a bakery. Bakeries sell their products at short intervals and have a very high inventory turnover. The inventory and, consequently, working capital is not very large.

Further, even within the same group of industries, the operating cycle may be different due to technological considerations. For economy in working capital, that process which has a shorter manufacturing process should be selected. Having selected a particular process of manufacture, steps should be taken to ensure that the cycle is completed in the expected time. This underlines the need for effective organization and coordination at all levels of the enterprise. Appropriate policies concerning terms of credit for raw materials and other supplies can help in reducing working capital requirements. Often, companies manufacturing heavy machinery and equipment minimize the investment in inventory or working capital by requiring advance payment from customers as work proceeds against orders. Thus, a part of the financial burden relating to the manufacturing cycle is passed on to others.

Business Cycle The working capital requirements are also determined by the nature of the business cycle. Business fluctuations lead to cyclical and seasonal changes which, in turn, cause a shift in the working capital position, particularly for temporary working capital requirements. The variation in business conditions may be in two directions (i) **upward** phase when boom conditions prevail, and (ii) **downswing** phase when economic activity is marked by a decline.

During the upswing of business activity, the need for working capital is likely to grow to cover the lag between increased sales and receipt of cash as well as to finance purchases of additional material to cater to the expansion of the level of activity. Additional funds may be required to invest in plant and machinery to meet the increased demand.

The downswing phase of the business cycle has exactly an opposite effect on the level of working capital requirement. The decline in the economy is associated with a fall in the volume of sales, which, in turn, leads to a fall in the level of inventories and account receivables. The need for working capital in recessionary conditions is bound to decline. In particular, business fluctuations influence the size of working capital mainly through the effect on inventories. The response of inventory to business cycles is mild or violent according to nature of the business cycle.

Production Policy The amount of working capital is also determined by production policy. In the case of certain lines of business, the demand for products is seasonal, that is, they are purchased during certain months of the year. What kind of production policy should be followed in such cases? There are two options open for such enterprises: either they confine their production only to periods when goods are purchased or they follow a steady production policy throughout the year and produce goods at a level to meet the peak demand. In the former case, there are serious production problems. During the slack season, the firms have to maintain their working force and physical facilities without adequate production and sale. When the peak period arrives, the firms have to operate at full capacity to meet the demand. This kind of arrangement would not only be expensive but also inconvenient. Thus, serious difficulties will be encountered in trying to match production to the ebb and flow of the seasonal demand pattern.

A better alternative is a steady production policy independent of shifts in demand for the finished goods. This means a large accumulation of finished goods (inventories) during the off-season and their abrupt sale during the peak season. The progressive accumulation of stock naturally requires an increasing amount of working capital which remains tied up for some months. Working capital planning has to incorporate this pattern of requirement of funds when production and seasonal sales are steady.

Steady production policy is, however, not necessarily adopted by all organizations. It may be possible, for instance, for some to follow a policy of diversification which enables them to engage the working force and the physical facilities in some other activity. If this is possible, there will be no major working capital problem. Moreover, the nature of some products may be such that accumulation of inventories may create special problem. For them, a production policy in tune with the changing demands may be preferable. Therefore, production policies have to be formulated on the basis of the individual setting of each enterprise and the magnitude and dimension of the working capital problems will accordingly away.

Credit Policy Credit policy relating to sales and purchases also affects the working capital. The credit policy influences the requirement of working capital in two ways: (i) through credit terms granted by the firms to its customers/buyers of goods; and (ii) credit terms available to the firm from its creditors.

The credit terms granted to customers have a bearing on the magnitude of working capital by determining the level of account receivables. The credit sales result in higher receivables. Higher receivables mean more working capital. On the other hand, if liberal credit terms are available from the suppliers of goods (trade creditors), the need for working capital is less. The working capital requirement of a business are, thus, affected by the terms of purchase and sale, and the role given to credit by a company in its dealings with creditors and debtors.

Credit terms fixed by an enterprise are affected by the prevailing trade practices as well as changing economic conditions. If, for example, competition is tight, there would be pressure to grant generous credit terms. Nevertheless, there is wide scope for managerial discretion in working out a suitable credit policy relevant to each customer. For instance, liberal credit facilities can be extended on the basis of credit rating. This will avoid the problem of having excess working capital.

Similarly, the collection procedure can be so framed that funds, which would otherwise be available for meeting operating needs are not locked up. Thus, adoption of rationalized credit policies would be a significant factor in determining the working capital needs of an enterprise. Such judgment may, however, not be available to a company which operates in a highly competitive market. To win and retain customers, it may be forced, among other things, to offer generous credit terms to them. The investment in receivables will consequently be of a higher order, necessitating large working capital in another way.

To be able to enjoy consumer patronage on a continuous basis, a firm will have to offer a variety of products quite unlike a firm which has a hold on the market and, hence, does not need special efforts to satisfy customer requirements. The consequence of a higher level of inventories would be an additional need for working capital. *The degree of completion is, therefore, and important factor influencing working capital requirements*.

Growth and Expansion As a company grows, it is logical to expect that a larger amount of working capital is required. It is, of course, difficult to determine precisely the relationship between the growth in the volume of business of a company and the increase in its working capital. The composition of working capital in a growing company also shifts with economic circumstances and corporate practices. With other things constant, growth industries require more working capital than those that are static. The critical fact, however, is that the need for increased working capital funds does not follow the growth in business activities but precedes it. Advance planning of working capital is, therefore, a continuing necessity for a growing concern. Or else, the company may have substantial earnings but little cash.

Fluctuation in the Availability of Raw Material: The availability or otherwise of certain raw materials on a continuous basis without interruption would sometimes affect the requirement of working capital. Either there may be some materials, which cannot be procured easily because of their sources, are few or they are irregular. To sustain smooth production, therefore, the firm might be forced to purchase and store them far in excess of genuine production needs. This will result in an excessive inventory of such materials. This happens very often with raw materials, which are in short supply and are because of their irregular supply. This happens very often with raw materials which are in short supply and are controlled to ensure equitable distribution.

The buyer has, in such cases, very limited options as to the amount and timing of procurement. It may happen that a bulk consignment be available but the firm may be short of funds. On the other hand, when surplus funds are available, the commodities may be in short supply. This element of uncertainty would lead to a relatively high level of working capital.

Finally, some raw materials may be available only during certain seasons. They would have to be necessarily obtained, when available, to provide for a period when supplies are lean. This will cause seasonal fluctuations in working capital requirements.

Profit Level Higher profit margin would improve the prospects of generating more internal funds thereby contributing to the working capital pool. The net profit is a source of working capital to the extent that it has been earned in cash.

The cash profit can be found by adjusting non-cash items such as depreciation, outstanding expenses and losses written off, in the net profit. But, in practice, the net cash inflows from operations cannot be considered as cash available for use at the end of cash cycle. Even as the company's operations are in progress, cash is used for augmenting stock, debts and fixed assets.

It must, therefore, be seen that cash generation has been used for furthering the enterprise. It is in this context that elaborated planning and projections of expected activities and the resulting cash inflows assume importance. This is because the processes can be taken to deal with surplus and deficit cash.

The availability of internal funds for working capital requirements is determined not merely by the profit margin but also by the manner of appropriating profits. The availability of such funds would depend upon the profit appropriations for taxation, dividend, reserves and depreciations.

Change in Price Level Changes in the price level also affect the requirement for working capital. Rising prices necessitates the use of more funds for maintaining an existing level of activity. For the same level of current assets, higher cash outlays are required. The effect of rising prices is that a higher amount of working capital is needed. However, in the case of companies which can raise their prices proportionately, there is no serious problem regarding working capital. Moreover, the price rise does not have a uniform effect on all commodities.

Operating Efficiency The operating efficiency of the management is also an important determinant of the level of working capital. Efficiency of operations accelerates the pace of cash cycle and improves the working capital turnover. It releases the pressure on working capital by improving profitability and improving the internal operation of funds.

> **Quick Check**
>
> Describe how production policy and production cycle affect the amount of working capital.

2.5. Financing Current Assets

An important working capital policy decision is concerned with the level of investment in current assets. Under a **flexible policy**, the investment in current assets is high. This means that the firm maintains huge balance of cash and marketable securities, carries large amounts of inventories, and grants generous terms of credit to customers, which leads to high level of debtors. Under the restrictive (rigid) policy, the investment in current assets is low. This means that a firm keeps a small balance of cash and marketable securities, manages with small amounts of inventories, and offers little terms of credit, which leads to a low level of debtors.

Determining the optimal level of current assets involves a trade-off between costs that rise with current assets and costs that fall with current assets. The former are referred to as **carrying costs** and later as **shortage costs**. Carrying costs are mainly the cost of financing a higher level of current assets. Shortage costs are mainly in the form of disorder in production schedule, loss of sales, and loss of customer goodwill**.** Thus, the firm has to determine the level of current assets where the total costs (sum of the carrying and short costs) is minimum in relative terms.

After establishing the level of current assets, the firm must determine how these should be financed. What mix of long-term capital and short-term debt should the firm employ to support its current asset?

Figure 2.4 below depicts how total assets, and hence the capital requirements, change over time for a growing firm. For the sake of simplicity, assets are divided into two classes, namely, fixed assets and current assets. Fixed assets are assumed to grow at a constant rate, which reflects the secular rate of growth in sales. Current assets, too, are expected to display the same long-term rate of growth. However, current assets exhibit substantial variation around the trend line with seasonal patterns in sale and/or purchases.

The investment in current assets may be broken down as permanent current assets and temporary current assets. The former represents what the firm requires even at the bottom of its sales cycles; the later reflects a variable component that moves in line with seasonal fluctuations.

Several strategies are available to a firm to finance its capital requirements**.** The following are three strategies which are illustrated by line A, B and C in Figure 5.4.

Conservative Strategy (A) Long – term financing source is used to meet fixed asset requirement as well as peak working capital requirement. When the working capital requirement is less than its peak level, the surplus is invested in liquid assets.

Hedging Strategy (B) Long – term financing is used to meet fixed asset requirement and permanent working capital requirement. Short-term financing is used to meet fluctuating working capital requirement.

Trade-Off Strategy between Conservative and Hedging (C) Long- term financing is used to meet fixed asset requirements, permanent working capital requirement, and a portion of fluctuating working capital requirement. During seasonal upswings, short-term financing is used; during seasonal downswings, surplus is invested in liquid assets.

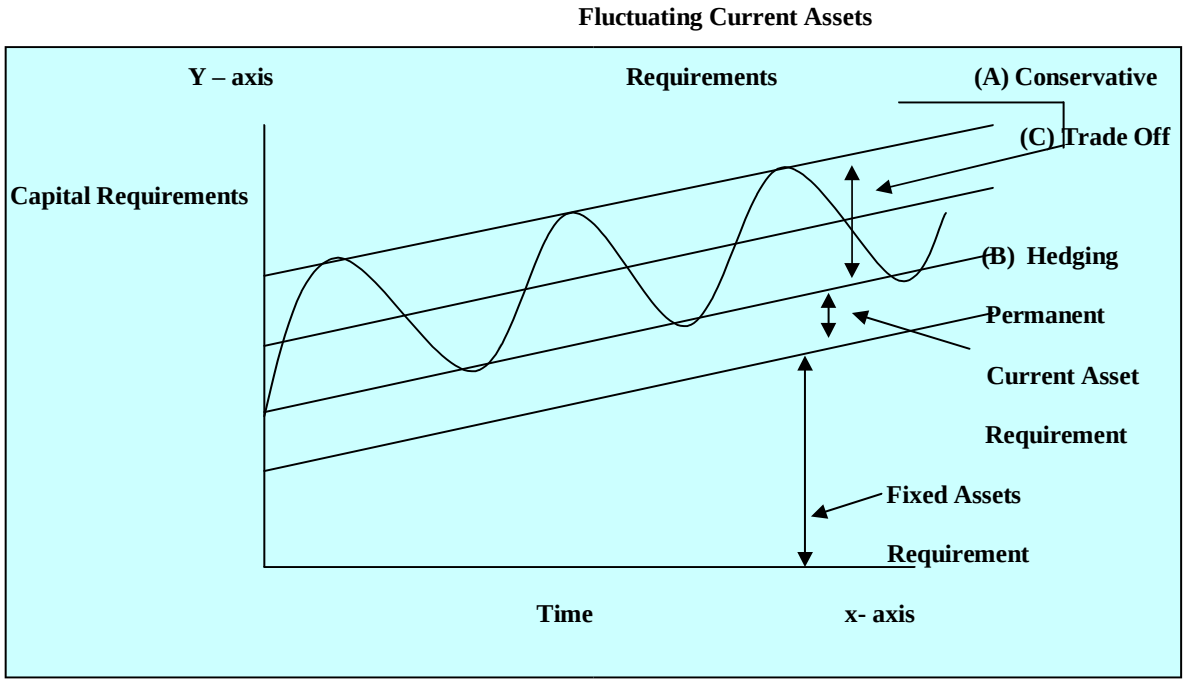


Figure 2.4 Current Assets Financing Strategies

Estimation of Working Capital Amounts

A number of methods can be employed to determine the amount of working capital required by a certain firm. Firms can use the operating cycle approach, the ratio of sales approach, and ratio of fixed investment approach. With regard to the first approach, what is required is the **average age of various types of inventories, the average collection period and the average payment period.** In the second approach, working capital requirement is determined as a percentage of sales. This can be done with the assumption that current assets are to be increasing with increase in sales. The last approach determines the required working capital as a proportion of the firm's fixed assets investment.

The summarized budgeted report of Astedu Company for the year 2008 shows the following information. Raw material cost of Br. 248,000, total conversion cost of Br. 388,800, total production cost of Br.968,000, annual sales of Br. 1,448,000, and fixed investment of Br. 1,600,000.

Astedu wants to use one of the three approaches to determine the amount of working capital required and has the following additional information to do so.

With regard to the first approach, **inventory** is one month's supply of each of the raw materials, semi-finished goods (fully completed material and half completed conversion cost) and finished goods. **Receivables** are one month's of sales. And **operating cash** is to be one month's total cost.

Under the second approach, the amount of working capital required is to be 25 – 35 percent of annual sales

And the third approach considers a 10-20 percent of fixed capital investment. Show the result of the three approaches for the total working capital needed. **Solutions**

Raw materials for one month's supply = 248,000/ 12 = **Br. 20,667**

Semi-finished or work-in-process (WIP) inventory for one month's supply = [Br. 20,667 + (388,800X0.5)] / 12 = **Br. 36,867**.

Finished goods inventory for one month's supply = 968,000/ 12 = **Br. 80,666**

So that the total **inventory** needed by Astedu Company is Br. 20,667 + Br.36, 867 + Br. 80,666 = Br. 138,200.

Receivables one month's of total sales forecasted = Br. 1,448,000/ 12 = Br. 120,667

Operating **cash need** as one month's of total cost = Br. 968,000/12 = Br. 80,667

Thus the total working capital needed is Br. 138,200 +Br.120,667+Br.80,667 = **Br.339,533**

Under the second approach:

The average ratio can be taken to determine the amount (i.e., (25+35)/ 2 =30 percent) of working capital needed. Therefore, 0.3 X Br. 1,448,000 = **Br.434,400**

The last method results in working capital of **240,000** (i.e., 1,600,000 x 0.15). The rate 15 percent is the average of 10- 20 percent. (10+20)/2 = 15 percent.

As it is shown in the above illustration, working capital depends on the budgeted level of activity in terms of productions/sales. The calculation of working capital is based on the

assumption that the production/sales are carryon evenly throughout the year and all costs accrue similarly.

In addition, the working capital requirements are related to the costs, which exclude depreciation, and not to the sale price, working capital is computed with reference to cash. The cash cost approach is comprehensive and superior to the operating cycle approach. The following steps can be employed in the estimation process of net working capital required

Summary of Computational Steps for the Estimation of Net Working Capital Required

Components of working capital		Computation
(I)CURRENT ASSETS **(A) Raw Materials**		Budgeted Production (In Units) x Cost of Raw Material Per unit x Average holding period of Raw Materials 12 Months / 365 Days / 52 Weeks
(B)	**Work –in – Progress** (i) Raw Materials	Budgeted Production (In Units) x Cost of Raw Material Per unit x Average time period of WIP inventory 12 Months / 365 Days / 52 Weeks
	(ii) Direct Labor	Budgeted Production (In Units) x Cost of Labor Per unit x Average time period of WIP inventory 12 Months / 365 Days / 52 Weeks
	(iii) Overheads (Excluding Depreciation)	Budgeted Production (In Units) x Cost of Overhead Per unit x Average time period of WIP inventory

		12 Months / 365 Days / 52 Weeks
(C)	**Finished Goods** (i) Raw Materials	Budgeted Production (In Units) x Cost of Raw Material Per unit x Average Holding period of Finished Goods 12 Months / 365 Days / 52 Weeks
	(ii) Direct Labor	Budgeted Production (In Units) x Cost of Labor Per unit x Average Holding period of Finished Goods 12 Months / 365 Days / 52 Weeks
	(iii) Overheads (Excluding Depreciation)	Budgeted Production (In Units) x Cost of Overhead Per unit x Average Holding period of Finished Goods 12 Months / 365 Days / 52 Weeks
(D)	**Accounts Receivables (Debtors)** (i) Raw Materials	Budgeted Production (In Units) x Cost of Raw Material Per unit x Average Collection period of Accounts Receivables

		12 Months / 365 Days / 52 Weeks

	(ii) Direct Labor)	Budgeted Production (In Units) x Cost of Labor Per unit x Average Collection period of Accounts Receivables 12 Months / 365 Days / 52 Weeks `
	(iii) Overheads (Excluding Depreciation	Budgeted Production (In Units) x Cost of Overhead Per unit x Average Collection period of Accounts Receivables 12 Months / 365 Days / 52 Weeks
(B) Lag in payment of Wages		Budgeted Production (In Units) x Cost of Labor Per unit x Average time period in payment of wages 12 Months / 365 Days / 52 Weeks

(C) Lag in payment of Overheads	Budgeted Production (In Units) x Cost of Overhead Per unit x Average time period in payment of Overheads 12 Months / 365 Days / 52 Weeks

The result obtained from the above computation of current assets, under A,B,C and D components, will be added up to give gross working capital. The balance of gross working capital also includes payments made in advance and cash and bank balances. In the same fashion current liabilities will be computed. The difference between gross working capital (current assets) and current liabilities is net working capital. If you add contingencies, say 5 per cent, of the net working capital, the required net working capital is to be established.

Illustrations

1. Esubalew Ltd., is required to purchase a business and has consulted you on how to do. One point, on which you are asked to advice, is the average amount of working capital, which will be required in the first year's operation. You are given the following estimates and are instructed to add 10% to your computed figure to allow for contingencies.

Estimates of Various Items		Amount (in Br.)
(I) Average amount of backed up for Stocks:		
Inventory of finished product		5,000
Inventory of raw materials		8,000
(II) Average Credit Given:		
Inland Sales,	6 weeks credit	312,000
Export Sales,	1.5 weeks credit	78,000
(III) Average time lag in payment of wages and other outgoings:		
Wages	1.5 weeks	260,000
Materials,	1.5 months	48,000
Rent	6 months	10,000
Top management Staff	½ month	62,400
Middle Manager Salary	½ month	4,800
Miscellaneous expenses	1 ½ months	48,000
(IV) Payment in Advance		
Sundry Expenses (paid quarterly in advance)		8,000
Not drawn Profits on an average throughout the year		11,000

Show how can you determine the average amount of working capital required?

Solution

(A) Current assets:	
i) Finished goods inventory	Br.5,000
ii) Raw material inventory	8,000
iii) Receivables	
Inland Sales (Br.312,000 x 6/52*)	36,000
Export Sales (Br.78,000 x 1.5/52)	2,250
Advance payment of sundry expenses (Br.8,000 x 1/4)	2,000
Total investment in current assets	Br.53,250
(B)Current liabilities	
i) Wages Payable (260,000 x1.5/52)	Br.7,500
ii) Account payable (Br. 48,000 x 1.5/12*)	6,000
iii) Rent payable (Br.10,000 x 6/12)	5,000
iv)Salary payable-top Management (Br.62,400x 0.5/12)	2,600
v) Salary payable middle management (Br.4,800 x0.5/12)	200
vi) Miscellaneous payables (Br.48,000 x 1.5/12)	6,000
Total estimated Current liabilities	Br. 27,300
(C) Net Working Capital	
i) Current assets – Current liabilities (A) - (B)	Br.25,950
ii) 10 percent contingency (25950 x 0.1)	2,595
Average amount of working capital required	Br. **28,545**

Shows the assumption that a year is 52 week or 12 months

Additional notes on the computations:

- ✓ The not drawn profit is not used in the process of determining working capital needed. This is because it may be i) first adjusted for income tax and dividends/drawings; and ii) it may not only used as source of working capital, but also for acquisition of fixed assets.
- ✓ If the firm is expected to have operating cash balance, it is to be added in the current asset section.

2. A company you know is accustomed to prepare proforma cost sheet. The following is the proforma cost sheet of that company.

Elements	Amount (in Br.)/unit
Elements of Cost:	
Raw Materials	80
Direct Labor	30
Overheads	60
Total Cost	170
Profit margin	30
Selling price	200

Additional information:

Raw materials stays in stores an average of one month; Materials in process (completion stage, 50%), on average half a month; Finished goods stay in stores an average of one month.

Credit allowed by suppliers is one month. Credit allowed to debtors is two month.

Average time-lag in payment of wages is 1½ weeks and one month for overhead expense. ¼ of the output is sold against cash; cash in hand and at bank is desired to be maintained at Br. 365,000.

You are required to prepare a statement showing the working capital needed to finance a level of activity of 104,000 units of production. You may assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. **Solution**

(A)Current Assets			
i) Raw material (104,000 units x Br.80 per unit x 4/52[@])			Br.640,000
ii) Work in Process			
Material	(104,000xBr.80x 2/52) x0.5	Br.160,000	
Labor	(104,000xBr.30x2/52) x0.5	60,000	
Overhead	(104,000x Br.60x2/52)x0.5	120,000	340,000
iii) Finished goods inventory (104,000 x Br.170 x4/52)			1,360,000
iv) Receivable (78,000* x Br.170x 8/52)			2,040,000
v) Cash in hand and at bank			365,000
Total investment in current assets			Br. 4,745,000
(B)Current liabilities			
i) Accounts payable (104,000 x Br.80 x 4/52)			Br. 640,000
ii) Overheads payable (104,000xBr.60x 4/52)			80,000
iii) Wages Payable (104,000xBr.30x 1.5/52)			90,000
Total estimate of current liabilities			Br.1,210,000
Net working capital (A) – (B)			Br.3,535,000

*

Shows that units sold on credit account to 78,000 units while the rest are sold on cash.

@A year and a month is assumed to have 52 and 4 weeks respectively.

Chapter Summary

Working capital management is the management of current assets and current liabilities as well as the interrelationship that exists between the two groups.

The concept of working capital lies on gross working capital and net working capital. Gross working capital is the total current assets of organizations. Net working capital is the residual difference of current assets and current liabilities.

Sufficient working capital is required by firms to sustain on their sales activities. The cash cycle is the heart of the need for working capital. The cash cycle is the time-gap between sales of goods and receipt of cash.

The working capital requirement of a firm may have a permanent and/or fluctuating nature. Permanent working capital is the minimum level of working capital required on continuous and uninterrupted basis. The amount of working capital fluctuating above and over the permanent working capital is temporary working capital.

The total amount of working capital requirement is affected by a wide variety of factors. The factors affect firms differently and their effect may be time dependent. The general nature of business, production cycle, business cycle, production policy, credit policy, growth and expansion trends, fluctuation in availability of raw materials, profit level, change in price level, and operating efficiency are among the factors that affect the amount of working capital required.

Determination of optimal level of current assets involves the determination of the trade-off between costs arise with current assets and costs that fall with current assets. Thus, the carrying cost and the short cost are the issues of considerations.

Several strategies are available for a firm to finance its working capital. The three strategies a firm can consider are: conservative strategy, hedging strategy and trade-off strategy between the conservative and the hedging strategies.

A number of methods can be employed to determine the amount of working capital required by a certain firm. Firms can use the operating cycle approach, the ratio of sales approach and ratio of fixed investment approach. With regard to the first approach, what is required is the average age of various types of inventories, the average collection period and the average payment period. In the second approach, working capital requirement is determined as a percentage of sales. The last approach determines the required working capital as a proportion of the firm's fixed assets investment.

Self-Test Activities

I. Multiple Choices

9. Firms need to maintain working capital due to one of the following reasons

   a) To have a smooth operation and to sustain their activities

   b) Due to the existence of time-gap between sales of goods and services and the receipt of cash

   c) To deal with problems arising out of immediate realization of cash against goods sold. d) a & b e) All

10. The following is correct about the need for working capital in an ascending order.

    a) Textile factories, Supermarkets , Hotels

    b) Hotels, Textile factories, Supermarkets

    c) Supermarkets, Hotels, Textile factories

    d) Supermarkets, Textile factories, Hotels

    e) none

11. Which of the following is not correct

    a) A strict credit policy a firm has the relative lower amount of working capital that

    the firm is to maintain.

    b) The larger the production cycle is more the need for working capital

    c) Seasonal fluctuation of material supply may bring larger volume of working

    capital in organizations.

    d) The need for working capital in recessionary condition is bound to decline e) All

    f) None

12. _____ determines the amount of working capital related to the decision on production of item throughout a year or production at demand?

a) business nature

b) production policy

c) production cycle

d) Business cycle

e) None

5._____ is financing strategy under which long – term financing is used to meet fixed asset requirement and permanent working capital requirement while short-tem financing is used to meet fluctuating working capital requirement.

a) Trade of strategy between conservative and hedging

b) Conservative strategy

c) Hedging strategy

d) all

II: Discussion Questions

1. Discuss how the following factors affect amount of working capital:

Business cycle,

Production Policy**,** and

Credit Policy,

III. Self Test Problems

1. The management of Achayu Corporation has called for a statement showing the working capital needed to finance a level of activity of 300,000 units of output for the year 2009. The corporation has established a cost structure for the major elements of production. The cost structure for the 300,000 unit level of production shown as follows

Items	Amount (in Br.)/Unit
Elements of Cost:	
Raw Materials	20
Direct Labor	5
Overheads	15
Total Cost	40
Profit	10
Selling price	50

Additional information:

Previous experiences indicate that raw materials are held in store for an average of two months. Work – in- progress will take at approximate of ½ a month's production. Finished goods remain in warehouse, on an average, for a month. Suppliers of materials extend credit for a month. The corporation allows two months credit to customers. A minimum cash balance of Br. 25,000 is expected to be maintained. The production pattern is assumed to be even during the year. Determine the amount of net working capital required.

2. While preparing a project report on behalf of a client you have collected the following facts. Estimate the net working capital required for that project. Add 10% to your computed figure to allow contingencies.

Items	Amount (in Br.)
Elements of Cost:	80
Raw Materials	30
Direct Labor	60

	Overheads (exclusive of depreciation Br. 10 per unit)	
Total Cost		170
	Profit	30
	Selling price	200

Additional Information:

Level of activity 104,000 units' production per annum

Raw material in store, average 4 weeks

Work in progress (assume 50% completion stage in respect of conversion costs and 100% completion in respect of material), average 2 weeks. Finished goods in store, average 4 weeks. Credit allowed by suppliers, average 4 weeks. Credit allowed to debtors, average 8 weeks Lag in payment of wages, average 1.5 weeks Cash at bank expected to be Br. 25,000.

You may assume that production is carried on evenly throughout the year (52 weeks) and wages and overheads accrue similarly. All sales are one credit basis only.

Required: Determine the amount of net working capital needed.

3. Tatu &Tutu Company presented you the following projection for the year 2010.

Annual sale is to be Br. 1,440,000; cost of production (including depreciation of Br. 120,000), Br. 1,200,000; raw materials purchases of Br. 705,000 and monthly expenditure of Br. 30,000.

Estimated opening inventory of raw materials is Br. 140,000 while estimated closing inventory of raw materials is Br. 125,000. Inventory norms are: raw materials, 2 months; work-in-progress, ½ month; finished goods, 1 month.

The firm enjoys a credit of half-a-month on its purchases and allows one month credit on its supplies. On sales order, the company receives an advanced of Br. 15,000.

You may assume that production is carried out evenly throughout the year and minimum cash balance desired to be maintained is Br. 35,000.

Required: Determine the amount of net working capital needed.

CHAPTER THREE

CASH AND LIQUIDITY MANAGEMENT

Introduction

Emerging views of modern corporate management consider cash as the lifeblood of business firms. It is needed to acquire supplies, resources, equipment, and other assets used in generating the products and services provided by the firm. It is also needed to pay wages and salaries to workers and managers, taxes to governments, interest and principal to creditors, and dividends to shareholders. More fundamentally, cash is the medium of exchange which allows management to carry on the various activities of a firm on day to day bases. As long as the firm has the cash to meet these obligations, financial failure is less probable. On the contrary, without cash, or at less access to it, bankruptcy becomes possibly visible for firms. However, it is not only the shortage that is costly for firms but also the excess cash balance kept.

Dear reader! It is essential for you to know how organizations establish effective mechanisms of managing their lifeblood. The chapter, therefore, is concerned with the management of cash in general and the maintenance of the minimum operating cash balance in particular.

Chapter Outline

3.1 Reasons for Holding Cash

3.2. Understanding Float

3.3. Cash Collection and Concentration

3.4. Managing Cash Disbursement

3.5. Investing Ideal Cash

3.6 Determining the target cash balance

Chapter Summary

Self-Test Activities

Chapter objectives

After you complete studying the chapter, you will be able to:

- ✓ Reason out why firms hold cash.
- ✓ Understand the float
- ✓ Know how the target cash balance determined
- ✓ Know strategies and techniques for managing operating cash balance.
- ✓ Understand areas of investment for idle cash

3.1. Concepts of Cash Management and reason for Holding Cash

Cash management is one of the key areas of working capital management. It involves managing money of a firm to avoid shortage; to minimize cash availability; and to get return on any idle cash. Apart from the fact that it is the liquid current asset, cash is the common denominator to which all current assets can be reduced because the other major liquid assets such as receivables and inventory are eventually converted into cash.

The term **cash** with reference to cash management is used in two senses. In a narrow sense, it is used broadly to cover currency and generally accepted equivalents of cash, such checks, drafts and demand deposits in banks. The broad view of cash also includes near-cash assets, such as marketable securities and time deposits in banks. The main characteristics of these are that they can be readily sold and converted into cash. They serve as a reserve pool of liquidity that provides cash quickly when needed. They also provide a short-term investment outlet for excess cash and are also useful for meeting planned outflow of funds. Here, the term cash management is employed in the broader sense.

Cash is non-earning or less productive asset as a result of which firms may scarify profit.

Even though it is non-earning asset, firms hold cash at least for the following four reasons.

(1) Transaction Motive

(2) Precautionary Motive

(3) Speculative Motive

(4) Compensating Motive

1. **Transaction Motive** Transaction motive also called cash for transaction is an important reason for maintaining cash balances. This refers to the holding of cash to meet routine cash requirements; to finance the transactions, which a firm carries on in the ordinary course of business. A firm enters into a variety of transactions to accomplish it objectives, which have to be paid for in the form cash. For example, cash payments have to be made for purchases, wages, operating expenses, financial charges like interest, taxes, dividends, and so on. Similarly, there is a regular inflow of cash to the firm from the sales operations, returns on outside investment, among others. These receipts and payments constitute a continuous two-way flow of cash. Nevertheless, the inflow (receipts) and outflows (payments / disbursements) do not perfectly coincide. At times receipts exceed outflows while, at other times, payments exceed inflow. At time when disbursements are excess of the current receipts, a firm must have an adequate cash balance.

   The requirement of cash balances to meet routine cash needs is known as the transactions motive and such motive refers to be holding of cash to met **anticipate obligations** whose timing is not perfectly synchronized with cash receipts.

2. **Precautionary Motive** Precautionary motive also termed as cash as hedges is another reason for holding cash. Unfortunately, a firm's future cash needs for transactions are often quite uncertain; emergencies may arise for which the firm needs immediate cash. The firm must hedge against these unexpected needs. Hence, in addition to the non-coincide of anticipated cash receipts and payments in the ordinary course of business, a firm may have to lay cash for purposes, which cannot be predicated or anticipated. The unexpected cash need at short notice may be result of floods, strikes and failure of important customers; bills may be presented for settlement earlier than expected; unexpected slowdown in collection of accounts receivables; cancellation of some order for goods as the customer is not satisfied; and sharp increase in cost of raw materials, among many others.

   The cash balances held in reserve for such random and unforeseen fluctuations in cash flows are called as precautionary balances. In other words, precautionary motive of

holding cash implies the need to hold cash to meet unpredictable obligations, which a negative sense/reason for holding cash.

3. **Speculative Motive** Speculative motive, which is referred to as cash for opportunities, is the desire of a firm to take advantage of opportunities. The opportunities present themselves at unexpected moments and are typically outside the normal course of business. While the precautionary motive is defensive in nature in that firms must make provisions to tide over unexpected contingencies, the speculative motive represents a positive and aggressive approach. Firms aim to exploit profitable opportunities and keep cash in reserve to do so. The speculative motive helps to take advantage of an opportunity of purchasing raw materials at reduced price on payment of immediate cash; a chance to speculate on interest rate movements by buying securities when interest rates are expected to decline among other.
4. **Compensating Motive** Modern business depends on banks for many services. While some of the services are paid for direct fees, the firm keeping compensating balances at the bank pays for others indirectly. Compensating balances are minimum checking account levels that the firm agrees to maintain at the bank. The firm in conjunction with bank loans also maintains compensating balances. Because the firm has agreed to keep the compensating balance above some specified minimum amount, the bank can safely loan this balance to other customers, thereby earning a rate of return on the balance. This is what the firm paying an indirect fee means. This **service motive** seems to be the dominant reason why today firms keep large levels of cash.

Benefits of Holding Sufficient Cash Balance

In addition to the above reason firms are encourage to maintain adequate cash balance. As a result of keeping adequate cash balances, firms will get the following specific benefits or advantages. Adequate cash balance

- Prevents insolvency or bankruptcy arising out of the inability of a firm to meet its obligations.
- Makes relationship with the bank is not to be strained (worried).

- Helps in developing good relations with trade creditors and suppliers of raw material, as prompt payment may help their own cash management.
- Enable cash discount to be availed of if payment is made within the due date.
- Leads to a strong credit rating which enables the firm to purchase goods on favorable terms and to maintain its line of credit with banks and other sources of credit.
- Helps to take advantage of favorable business opportunities that may be available periodically, and
- Enable the firm to meet unanticipated cash expenditure with a minimum of strain during emergencies, such as strikes, fires or a new marketing campaign by competitors.

3.2. Understanding Float

As you no doubt know, the amount of money you have according to your checkbook can be very different from the amount of money that your bank thinks you have. The reason is that some of the checks you have written have not yet been presented to the bank for payment. The same thing is true for a business. The cash balance that a firm shows on its books is called the firm's book, or ledger, balance. The balance shown in its bank account as available to spend is called its available, or collected, balance. The difference between the available balance and the ledger balance is called the float, and it represents the net effect of checks in the process of clearing (moving through the banking system). Therefore, the **float** is defined as the difference between book cash and bank cash, representing the net effect of checks in the process of clearing.

Disbursement Float

Checks written by a firm generate disbursement float, causing a decrease in the firm's book balance but no change in its available balance. For example, suppose ABC Company, currently has $100,000 on deposit with its bank. On June 8, it buys some raw materials and pays with a check for $100,000. The company's book balance is immediately reduced by $100,000 as a result.

ABC Company's bank, however, will not find out about this check until it is presented to ABC Company's bank for payment on, say, June 14. Until the check is presented, the firm's available balance is greater than its book balance by $100,000. In other words, before June 8, ABC has a zero float:

Float = Firm's available balance - Firm's book balance

=100,000 - 100,000

=$0

ABC Company's position from June 8 to June 14 is:

Disbursement float = Firm's available balance - Firm's book balance

=$100,000 - 0

=$100,000

During this period of time that the check is clearing, ABC Company has a balance with the bank of $100,000. It can obtain the benefit of this cash while the check is clearing. For example, the available balance could be temporarily invested in marketable securities and thus earn some interest.

Collection Float and Net Float

Checks received by the firm create collection float. Collection float increases book balances but does not immediately change available balances. For example, suppose ABC Company receives a check from a customer for $100,000 on October 8. Assume, as before, that the company has $100,000 deposited at its bank and a zero float. It deposits the check and increases its book balance by $100,000 to $200,000.However, the additional cash is not available to ABC Company until its bank has presented the check to the customer's bank and received $100,000. This will occur on, say, October 14. In the meantime, the cash position at ABC Company will reflect a collection float of $100,000. We can summarize these events. Before October 8, ABC Company's position is:

Float = Firm's available balance - Firm's book balance

=$100,000 - 100,000 =$0

ABC Company's position from October 8 to October 14 is:

Collection float = Firm's available balance - Firm's book balance

=$100,000 - 200,000

= - $100,000

In general, a firm's payment (disbursement) activities generate disbursement float, and its collection activities generate collection float. The net effect, that is, the sum of the total collection and disbursement floats, is the net float. The net float at a point in time is simply the overall difference between the firm's available balance and its book balance. If the net float is positive, then the firm's disbursement float exceeds its collection float, and its available balance exceeds its book balance. If the available balance is less than the book balance, then the firm has a net collection float.

A firm should be concerned with its net float and available balance more than with its book balance. If a financial manager knows that check written by the company will not clear for several days, that manager will be able to keep a lower cash balance at the bank than might be possible otherwise. This can generate a great deal of money.

For example, take the case of XYZ Company. The average daily sales of XYZ Company are about $650 million. If XYZ Company's collections could be speeded up by a single day, then XYZ Company could free up $650 million for investing. At a relatively modest .015 percent daily rate, the interest earned would be about $97,500 per day.

Float Management

Float management involves controlling the collection and disbursement of cash. The objective in cash collection is to speed up collections and reduce the lag between the time customers pay their bills and the time the cash becomes available. The objective in cash disbursement is to control payments and minimize the firm's costs associated with making payments.

Total collection or disbursement times can be broken down into three parts: mailing time, processing delay, and availability delay:

1. **Mailing time:** is the part of the collection and disbursement process during which checks are trapped in the postal system.
2. **Processing delay:** is the time it takes the receiver of a check to process the payment and deposit it in a bank for collection.
3. **Availability delay:** refers to the time required to clear a check through the banking system.

Speeding up collections involves reducing one or more of these components. Slowing disbursements involves increasing one of them. We will describe some procedures for managing collection and disbursement times later. First, we need to discuss how float is measured.

Measuring Float: The size of the float depends on both the dollars and the time delay involved. For example, suppose you mail a check for$500 to another state each month. It takes five days in the mail for the check to reach its destination (the mailing time) and one day for the recipient to get over to the bank (the processing delay). The recipient's bank holds out-of-state checks for three days (availability delay). The total delay is 5 + 1 + 3 = 9 days.

In this case, what is your average daily disbursement float? There are two equivalent ways of calculating the answer. First, you have a $500 float for nine days, so we say that the total float is 9 * $500 = $4,500. Assuming 30 days in the month, the average daily float is $4,500/30 = $150.

Alternatively, your disbursement float is $500 for 9 days out of the month and zero the other 21 days (again assuming 30 days in a month). Your average daily float is thus:

Average daily float = (9 * $500 + 21 * 0)/30

= 9/30 * $500 + 21/30 * 0

= $4,500/30

=$150

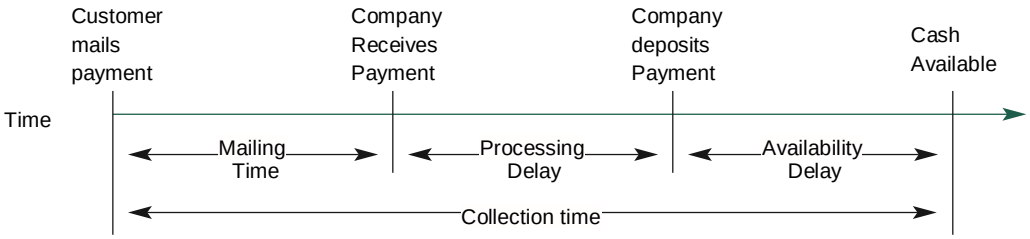
This means that, on an average day, your book balance is $150 less than your available balance, representing a $150 average disbursement float.

3.3. Cash Collection and Concentration

From our previous discussion, we know that collection delays work against the firm. All other things being the same, then, a firm will adopt procedures to speed up collections and thereby decrease collection times. In addition, even after cash is collected, firms need procedures to funnel, or concentrate, that cash where it can be best used.

Components of Collection Time

Based on our previous discussion, we can depict the basic parts of the cash collection process as follows: the total time in this process is made up of mailing time, check processing delay, and the bank's availability delay.



The amount of time that cash spends in each part of the cash collection process depends on where the firm's customers and banks are located and how efficient the firm is in collecting cash.

Cash Collection Techniques

The inflow of cash can be accelerated through systematic and refined techniques. This can be done: through encouraging customers to pay as quickly as possible; and by converting payments from customers into cash without delay.

1. **Prompt Payment by Customers**: One way to ensure prompt payment by customer is prompt billing. What the customer has to pay and the period of payment should be notified accurately and in advance. The use of mechanical devices for billing along with the enclosure of a self-addressed return envelope will speed up payment of customers. Another, and more important, technique to encourage prompt payment by customers is the practice of offering cash discount. The availability of discount implies

considerably saving to the customers. To avail of the facility, the customers would be eager to make payment early.

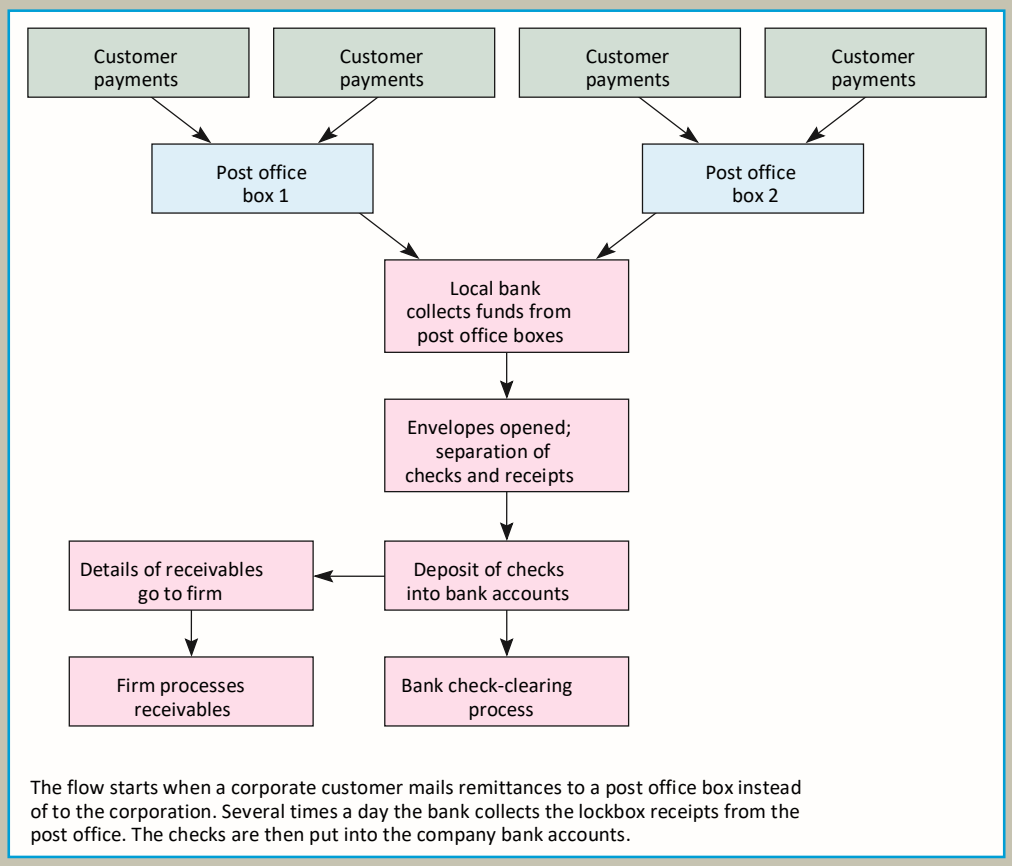
2. **Early Conversion of Payments into cash**: Once the customer makes the payment by writing checks (if available),in favor of the firm, the collection can be speed up by prompt encashment of the checks. There is a lag between the time a check is prepared and mailed by the customer and the time the funds are include in the cash reservoir of the firm. Within this time interval three steps are involved: (A) Transit or mailing time, that is, the time taken by the post offices to transfer the checks from the customers to the firm. This delay or lag is referred to as postal float. (B) Time taken in processing the checks within the firm before they are deposited in banks is termed as lethargy; and (C) Collection time within the bank, that, the time taken by the bank in collecting the payment from the customer's bank.

   This is also called bank float. The early conversion of payment into cash, as a technique to speed up collection of accounts receivable, is done to reduce the time lag between posting of the checks by the customer and the realization of money by the firm. The total time lag can be reduced through decentralized collection. The principal decentralized collection systems are concentration banking and lock-box system

3. **Lock-Box System**: The concentration banking arrangement is instrumental in reducing the time involved in mailing and collection. However, with this system, processing for purpose of internal accounting involved, that is, sometime passes before a checks deposited by the local collection center. The lock-box system takes care of this kind of problem apart from effecting economy in mailing and clearance times. Under this arrangement, firms hire a post office lock-box at important collection centers. The customers are required to remit payments to the post office lock-box. The local banks of the firm, at the respective places, are authorized to open the box and pick up the checks received from the customers. Usually, the authorized banks pick up the checks several times a day and deposit them in the firm's accounts. After crediting the account of the firm, the banks send a deposit slip along with the list of payments and other enclosures, if any, to the firm by way of proof and record of the collection.

Overview of Lockbox Processing

FIGURE 3.1



The flow starts when a corporate customer mails remittances to a post office box instead of to the corporation. Several times a day the bank collects the lockbox receipts from the post office. The checks are then put into the company bank accounts.

Cash Concentration

As we discussed earlier, a firm will typically have a number of cash collection points, and, as a result, cash collections may end up in many different banks and bank accounts.

From here, the firm needs procedures to move the cash into its main accounts. This is called cash concentration. By routinely pooling its cash, the firm greatly simplifies its cash management by reducing the number of accounts that must be tracked. In addition, by having a larger pool of funds available, a firm may be able to negotiate or otherwise obtain a better rate on any short-term investments.

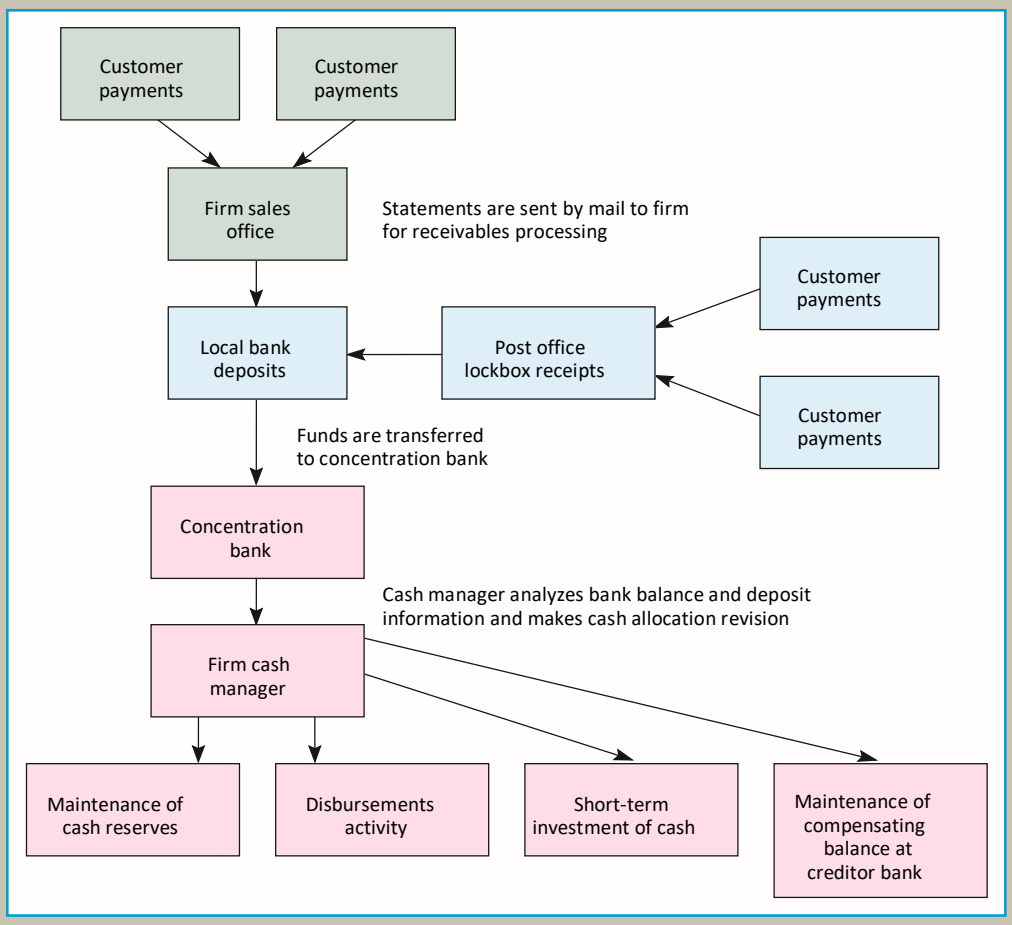
In setting up a concentration system, firms will typically use one or more concentration banks. A concentration bank pools the funds obtained from local banks contained within some geographic region. Concentration systems are often used in conjunction with lockbox systems. Figure 3.2 illustrates how an integrated cash collection and cash concentration system might look. As Figure 3.2 illustrates, a key part of the cash collection and concentration process is the transfer of funds to the concentration bank.

There are several options available for accomplishing this transfer. The cheapest is a depository transfer check (DTC), which is a preprinted check that usually needs no signature and is valid only for transferring funds between specific accounts within the same firm. The money becomes available one to two days later. Automated clearinghouse (ACH) transfers are basically electronic versions of paper checks. These may be more expensive, depending on the circumstances, but the funds are available the next day. The most expensive means of transfer are wire transfers, which provide same-day availability. Which approach a firm will choose depends on the number and size of payments.

For example, a typical ACH transfer might be $200, whereas a typical wire transfer would be several million dollars. Firms with a large number of collection points and relatively small payments will choose the cheaper route, whereas firms that receive smaller numbers of relatively large payments may choose procedures that are more expensive.

Lockboxes and Concentration Banks in a Cash Management System

FIGURE 3.2



3.4. Managing Cash Disbursement

The operating cash requirement can also be reduced through slowing disbursement of payments. The process may ask care for not to be overloaded with interest payments. The major techniques under this section are described as follows.

1. **Avoidance of Early Payments:** One way to delay payments is to avoid early payments. According to terms of credit, a firm is required to make a payment within a stipulated period. It entitles a firm to cash discounts. If, however payments are delayed beyond the due date, the credit standing may be adversely affected so that the firms would find it difficult to secure trade credit later. Nevertheless, if the firm pays

its accounts payable before the due date it has no special advantage. Thus, a firm would be well advised not to make payments early, that is, before the due date.

2. **Float** A very important technique of slow disbursements is float. The tem float refers to the amount of money tied up in checks that have been written, but have yet to be collected and encashed. Alternatively, float represents the difference between the bank balance and book balance of cash of a firm. The difference between the balance as shown by the firm's record and the actual bank balance is due to transit and processing delays. There is a time-lag between the issue of a check by the firm and its presentation to its bank by the customer's bank for payment. The implication is that although the checks has been issued, cash would be required later when the checks is presented for encashment. Float can be created using the following:

- ✓ **Paying from Distant Bank** The firm may issue a check on banks away from the creditor's bank. This would involve relatively longer transit time for the creditor's bank to get payment and, thus, enable the firm to use its funds longer.
- ✓ **Checks-Encashment Analysis** Another way to make use of float is to analyze, based on past experience, the time-lag in the issue of checks and their encashment. For instant, checks issued to pay wages and salary may not be enchased immediately; it may be spread over a few days say 25% on one day, 50% on the second day and the balance on third day. It would means hat the firm should keep in the bank not the entire amount of a payroll but only a fraction represented by the actual withdrawal of each day. This strategy would enable the firm to save operating cash.
- ✓ **Accruals** Finally, a potential tool for stretching accounts payable is accruals, which are, define as current liabilities that represent a service or goods received by a firm but not yet paid. For example, payrolls, that is, remuneration to employees who render service in advance and receive payment later. In a way, they extend credit to the firm for a period at the end of which they are paid, say, a week or a month. The longer the period after which payment is made, the greater is the amount of free financing consequently and the smaller is the amount of cash balances required.

Note that from the firms view point, disbursement float is desirable. To get the benefit, firms may develop strategies to increase mail float, processing float and available float on the checks they write. However, techniques for maximizing disbursement float are debatable on both ethical and economic grounds.

(1) Payment terms (agreement) very frequently offer a substantial discount for early payment. The discount usually is much larger than any possible savings from "**playing the float game"**

(2) Suppliers are not likely to be fooled by attempt to slow down disbursement. The negative consequences from poor relations with suppliers can be costly. Intentionally delaying payments by taking advantage of mailing times or unsophisticated suppliers may amount to avoiding paying bills when they are due, which is an unethical business procedure.

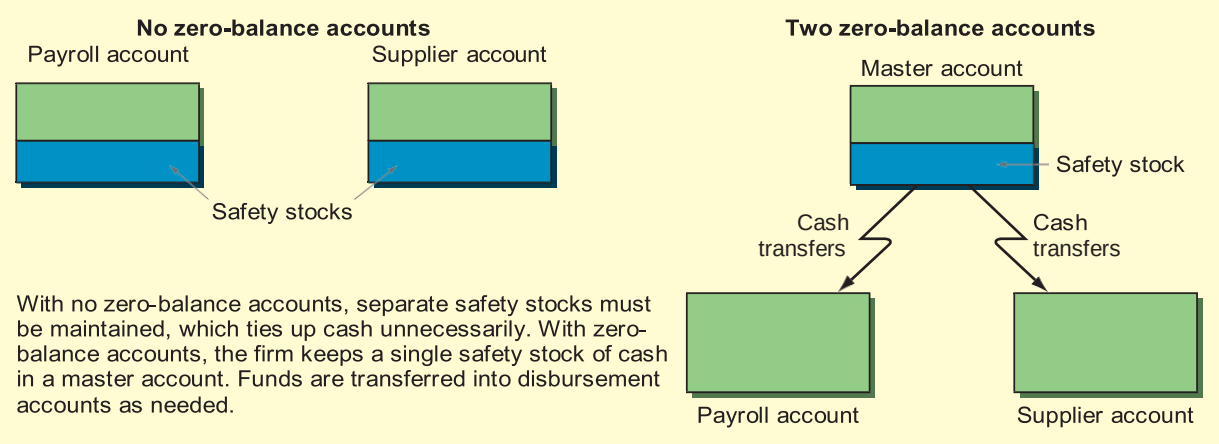
3. **Centralized Disbursements** You have seen that maximizing disbursement float is probably poor business practice. However, a firm will still wish to tie up as little cash as possible in disbursements. Firms have, therefore, developed systems for efficiently managing the disbursement process. Hence another method to slow down disbursements is to have centralized or controlled disbursements. All the payments should be made by the head office from a centralized disbursement account or a master account. Such an arrangement would enable a firm to delay payments and conserve cash for several reasons. A typical technique of centralization disbursement is Zero-Balance Accounts.
4. **Zero- balance accounts** With a zero-balance account, the firm in cooperation with its bank maintains a master account and a set of sub accounts. When a check written on one of the sub accounts is to be paid, the necessary amounts are transferred in from the master account. The process avoids the need for maintaining cash (safety) balance at each sub account. See the diagram below with a non-zero balance and two zero balance accounts.

Quick Check

What do you observe from the diagram?

With non-zero balance account, separate safety balances must be maintained, which ties cash unnecessarily. With zero balance account, the firm keeps a single safety balance of cash in a master account. Cash is transferred into disbursement accounts as needed.

FIGURE 3.3. Zero-Balance Accounts



3.5. Investment opportunities for Idle Cash

Firms once determine the optimum operating cash balance, the amount of cash above the operating balance has to be invested. Marketable equity securities are commonly used areas of investment for idle cash of firms. These securities are short-term investment instruments to obtain a return on temporarily idle cash.

The basic characteristics of marketable securities affect the degree of marketability. A security has to be liquid so that easily be converted into cash at demand. For a security to be liquid at least the following two basic characteristics should be maintained.

1. There must be a ready market for the security. Ready marketability minimizes the amount of time required to convert a security into cash. A ready marketability should have both breadth in the sense of large number of participants scattered over a wide

geographic area as well as a depth as determined by its ability to absorb the purchase or sale of amount of securities.

2. Safety of the principal amount should be maintained. There should be little or no loss in the value of a marketable security over time. Only those securities that can be easily converted into cash without any reduction in the principal amount qualify for short-term investments.

While selecting marketable securities an assessment of certain criteria is essential. Financial risk, interest rate risk, taxability, liquidity and yield potential of the marketable securities are to be investigated at the time of selection.

The most know marketable securities are: treasury bills, negotiable certificate of deposits, commercial papers, bankers' acceptance, repurchase agreements and inter-corporate deposits.

> **Quick Check**
>
> What are marketable equity securities? When is the need to invest in marketable securities needed?

3.6. Determining the target cash balance

The target cash balance involves a trade-off between the opportunity costs of holding too much cash (the carrying costs) and the costs of holding too little (the shortage costs, also called adjustment costs). The nature of these costs depends on the firm's working capital policy. If the firm has a flexible working capital policy, it will probably maintain a marketable securities portfolio. In this case, the adjustment, or shortage, costs will be the trading costs associated with buying and selling securities. If the firm has a restrictive working capital policy, it will probably borrow in the short term to meet cash shortages. The costs in this case will be the interest and other expenses associated with arranging a loan.

The BAT Model

The Baumol–Allais–Tobin (BAT) model is a classic means of analyzing our cash management problem. We will show how this model can be used to actually establish the target cash balance.

It is a straightforward model useful for illustrating the factors in cash management and, more generally, current asset management.

To develop the BAT model, suppose the Golden Socks Corporation starts off at week 0 with a cash balance of C = $1.2 million. Each week, outflows exceed inflows by $600,000. As a result, the cash balance will drop to zero at the end of week 2. The average cash balance will be the beginning balance ($1.2 million) and the ending balance ($0) divided by 2, or ($1.2 million + 0)/2 = $600,000, over the two-week period. At the end of week 2, Golden Socks replenishes its cash by depositing another $1.2 million

Because transaction costs (for example, the brokerage costs of selling marketable securities) must be incurred whenever cash is replenished, establishing large initial balances will lower the trading costs connected with cash management. However, the larger the average cash balance, the greater is the opportunity cost (the return that could have been earned on marketable securities).

To determine the optimal strategy, Golden Socks needs to know the following three things:

F = The fixed cost of making a securities trade to replenish cash.

T = The total amount of new cash needed for transaction purposes over the relevant planning period—say, one year.

R = The opportunity cost of holding cash. This is the interest rate on marketable securities.

With this information, Golden Socks can determine the total costs of any particular cash balance policy. It can then determine the optimal cash balance policy.

The Opportunity Costs: To determine the opportunity costs of holding cash, we have to find out how much interest is forgone. Golden Socks has, on average, C/2 in cash. This amount could be earning interest at rate R. Therefore, the total dollar opportunity costs of cash balances are equal to the average cash balance multiplied by the interest rate:

Opportunity costs = (C /2) x R

The Trading Costs: To determine the total trading costs for the year, we need to know how many times Golden Socks will have to sell marketable securities during the year. First, the total amount of cash disbursed during the year is $600,000 per week, so T = $600,000 x 52 weeks = $31.2 million. If the initial cash balance is set at C = $1.2 million, Golden Socks will sell $1.2 million in marketable securities: T/C $31.2 million/1.2 million =26 times per year. It costs *F* dollars each time, so trading costs are given by:

$31.2 million / $1.2 million * F = 26 * F

In general, the total trading costs will be given by:

Trading costs = (T / C) * F

The Total Cost = Now that we have the opportunity costs and the trading costs, we can calculate the total cost by adding them together:

Total cost = Opportunity costs +Trading costs

= (C/2) * R + (T/C) * F

Optimal size of the cash: occurs when the opportunity costs and the trading costs are exactly equal. So at C*, we must have that:

Opportunity costs =Trading costs

(C*/2) * R = (T/C*) * F

With a little algebra, we can write:

C^{*2} = (2T * F)/ R

To solve for C*, we take the square root of both sides to get

$$C^* = \frac{\sqrt{2T \times F}}{R}$$

Example: The xyz Corporation has cash outflows of $100 per day, seven days a week. The interest rate is 5 percent, and the fixed cost of replenishing cash balances is $10 per transaction. What is the optimal initial cash balance? What is the total cost?

The Miller–ORR model: a more general approach

We now describe a cash management system designed to deal with cash inflows and outflows that fluctuate randomly from day to day. With this model, we again concentrate on the cash balance. In contrast to the situation with the BAT model, we assume that this balance fluctuates up and down randomly and that the average change is zero.

It operates in terms of an upper limit (U*) and a lower limit (L) to the amount of cash, as well as a target cash balance (C*). The firm allows its cash balance to wander around between the lower and upper limits.

As long as the cash balance is somewhere between U* and L, nothing happens. When the cash balance reaches the upper limit (U*), as it does at point X, the firm moves U* - C* dollars out of the account and into marketable securities. This action moves the cash balance down to C*. In the same way, if the cash balance falls to the lower limit (L), as it does at point Y, the firm will sell C* - L worth of securities and deposit the cash in the account. This action takes the cash balance up to C*.

Using the Model: To get started, management sets the lower limit (L). This limit essentially defines a safety stock; so where it is set depends on how much risk of a cash shortfall the firm is willing to tolerate. Alternatively, the minimum might just equal a required compensating balance.

As with the BAT model, the optimal cash balance depends on trading costs and opportunity costs. Once again, the cost per transaction of buying and selling marketable securities, F, is assumed to be fixed. In addition, the opportunity cost of holding cash is R, the interest rate per period on marketable securities.

The only extra piece of information needed is $\boldsymbol{\sigma^2}$, the variance of the net cash flow per period. For our purposes, the period can be anything a day or a week, for example as long as the interest rate and the variance are based on the same length of time.

Given L, which is set by the firm, Miller and Orr show that the cash balance target, C*, and the upper limit, U*, that minimize the total costs of holding cash are:

$C^* = L + (3/4 \times F \times \sigma^2 / R)^{(1/3)}$

$U^* = 3 \times C^* - 2 \times L$

In addition, the average cash balance in the Miller–Orr model is:

Average cash balance = $(4 \times C^* - L)/3$

Example: suppose F = $10, the interest rate is 1 percent per month, and the standard deviation of the monthly net cash flows is $200. Assume that a minimum cash balance of L = 100. Calculate the target cash balance target.

Implications of the BAT and Miller–ORR models

Our two cash management models differ in complexity, but they have some similar implications. In both cases, all other things being equal, we see that:

1. The greater the interest rate, the lower is the target cash balance.
2. The greater the order cost, the higher is the target balance. These implications are both obvious. The advantage of the Miller–Orr model is that it improves our understanding of the problem of cash management by considering the effect of uncertainty as measured by the variation in net cash inflows. The Miller–Orr model shows that the greater the uncertainty is (the higher σ^2 is), the greater is the difference between the target balance and the minimum balance. Similarly, the greater the uncertainty is, the higher is the upper limit and the higher is the average cash balance. These statements all make intuitive sense. For example, the greater the variability is, the greater is the chance that the balance will drop below the minimum. We thus keep a higher balance to guard against this happening.

Other factors influencing the target cash balance

Before moving on, we briefly discuss two additional considerations that affect the target cash balance.

First, in our discussion of cash management, we assume cash is invested in marketable securities such as Treasury bills. The firm obtains cash by selling these securities. Another

alternative is to borrow cash. Borrowing introduces additional considerations to cash management:

1. Borrowing is likely to be more expensive than selling marketable securities because the interest rate is likely to be higher.
2. The need to borrow will depend on management's desire to hold low cash balances. A firm is more likely to have to borrow to cover an unexpected cash outflow with greater cash flow variability and lower investment in marketable securities.

Second, for large firms, the trading costs of buying and selling securities are small when compared to the opportunity costs of holding cash.

Chapter Summary

Cash management is one of the key areas of working capital management. Cash management is effective and efficient utilization of operating cash balance and investing the temporarily idle cash in short term investment areas.

Cash is non-earning current asset. It is held for transaction motives, precautionary motives, speculative motives and compensating motives. In the sense of transaction motive, firms hold cash for smooth operation of their every day and for settling anticipated obligations whose timing is not synchronizes with cash receipts. The precautionary reasoning is to meet unpredictable disadvantageous occurrences. The speculative motive is concerned with benefits that may emerge in unusual situations and unpredictable circumstances. Firms also hold cash for compensating banks, which provide banking services.

The amount of cash particularly the operating cash balance is determined by a detailed investigation of synchronization of cash flows, costs of shortfall and excess cash balance, procurement and management costs, prevalence of uncertainty, and compensating balance requirements.

Planning cash is a technique ton plan and control the use of cash. It is a potential area to resolve problems of handling excess cash and suffers from cash shortages. Cash budget is one of the primary tools in short-run financial planning. Cash management can be prepared with the use of receipt and disbursement method, or the adjustment method.

The broad cash management techniques are essentially related to the cash cycle and the cash turnover. These broad techniques are: stretching accounts payable period, speeding collection of accounts receivables, efficient inventory-production management, and a combination of them.

Specific techniques and processes for speedy collection of receivables from customers are ensuring prompt payment and early conversion of payments into cash. The concentration banking and lock-box system are essentially used as a decentralized collection networks. The techniques to slow down payments of accounts payable include avoidance of early payments,

centralized disbursements and float. The techniques disbursement floats are abatable at least from both ethical and economic grounds.

Finally, short -term investments such as marketable equity securities are areas of investing temporarily idle cash. The target cash balance is determined by using BAT and Miller – ORR model.

Self-Test Activities

I. Multiple choices

1. One of the following is not cost resulted from cash shortfall.
    a) Brokerage fee
    b) Interest
    c) Loss of cash discount
    d) salary and handling cost
    e) e) none
2. One of the following is not used to slow down disbursements
    a) lock-box system
    b) Zero-balance account
    c) Payment at distant bank
    d) Use of accruals
    e) None
3. Assume that you are assigned to determine the cash need of **AB Company** which is merchandizing in nature. Which one of the following factors do you need to consider while determining the required amount?
    a) Analysis of the match between cash inflow and outflow
    b) Investigating the possible excess cash balance cost
    c) Determine the procurement and management requirement
    d) All
    e) None
4. _____is the reason of firms to hold cash for the purpose of settling salary payments of employees

a) Speculative motive

b) Transaction motive

c) Precautionary motive

d) Compensation motive

e) None

Assume that Ato Yayutal has a retailing center. He purchases Br. 5000 worth of items on credit on one day. He pays the bill 30 days later and after an extra 30days he sells all the items for Birr 6,000. His customers do not actually pay for another 30 days.

Use the information for Yayutal center for question 5 to 7

5. What is average age of inventories in Yayutal's store?

a) 30 days c) 45 days

b) 60 days d) 65 days

6. The operating cycle of Yayutal Center is

a) 30 days c) 60 days

b) 45 days d) 90 days

7. The cash cycle is

a) 30 days c) 60 days

b) 45 days d) 90 days

8. Identify the correct one

a) The higher the cash turnover, the higher is the need for minimum cash balance.

b) The longer the cash cycle, the higher is the amount of cash kept by firms

c) The longer the account payable period, the larger amount of cash balance needed

d) The shorter the average collection period, the more the need for cash in firms' drawer

e) All

II. Self-Test Problem

STP1. From the following forecasts of income and expenditure, you are required to prepare a cash budget for three months ending November 30. The bank balance on September 1 was Br. 10,000

Month	Sales	Purchases	Wages	Factory Expenses	Office Expenses
July	80,000	40,000	5,600	3,900	10,000
August	76,500	42,000	5,800	4,100	12,000
September	78,000	38,500	5,800	4,200	14,000
October	90,000	37,500	5,900	5,100	16,000
November	95,000	43,000	5,900	6,000	18,000

A sales commission of 4 percent on sales, due in the month following the month in which the sales dues are collected, is payable in addition to office expense. Fixed assets worth Br. 65,000 will be purchased in September to be paid for the following month. Br. 20,000 in respect of Bonds interest will be paid in October. The period of credit allowed to customers is two months and one month credit is obtained from suppliers of goods. Wages are paid on an average of 1st and 16th of each month in respect of dues for period ending on the date proceeding such days. Expenses are paid in the month in which they are due.

CHAPTER FOUR

RECEIVABLE MANAGEMENT

Introduction

Dear reader! You are now on the second chapter from the last. Business organizations which provide goods or services on credit report one of the current assets in their balance sheets. The amount of account receivable in the current asset section of the balance sheet is not randomly determined and the amount is not for nothing. It rather has passed through at least three crucial decisions; and it is to increase sales and to enable firms stay competitive in the market. This Chapter with the following outlines and objectives is designed to help you know the decisions of business organizations in managing receivables.

Chapter Outline

4.1. Credit and receivables

4.2. Terms of sale

4.3. Analyzing credit policy

4.4. Credit Analysis

4.5. Collection policy

Chapter Summary

Self-Test Activities

Chapter Objectives

After completing the chapter, you will be able to

- Define receivables and receivable management
- Understand why receivable management is required by business organizations
- Identify the factors that affect accounts receivables in business firms
- Sort out the benefits and costs of receivables and their management
- Know the three crucial decisions in receivables management

4.0. Receivables: An Introduction

Accounts receivables constitute significant portion of total current assets. When a firm sells goods for cash, payments are received immediately and therefore, no receivables are created. However, when a firm sells goods or services on credit, the payments are postponed to future dates and receivables are created. Usually credit sales are made on open account which means that no formal acknowledgements of debt obligations are taken from the buyers. The only documents evidencing the same are a purchase order, shipping invoice or even a billing statement. The policy of open account sales facilitates business transactions and reduces to a great extent the paper work required in connection with credit sales. Hence, receivables are asset accounts representing amount owed to the firm as a result of sale of goods or services in the ordinary course of business.

4.1. Credit and receivables

When a firm sells goods and services, it can demand cash on or before the delivery; date or it can extend credit to customers and allow some delay in payment. The next few sections provide an idea of what is involved in the firm's decision to grant credit to its customers. Granting credit is making an investment in a customer—an investment tied to the sale of a product or service.

Why do firms grant credit? Not all do, but the practice is extremely common. The obvious reason is that offering credit is a way of stimulating sales. The costs associated with granting credit are not trivial. First, there is the chance that the customer will not pay. Second, the firm has to bear the costs of carrying the receivables. The credit policy decision thus involves a trade-off between the benefits of increased sales and the costs of granting credit.

From an accounting perspective, when credit is granted, an account receivable is created. Such receivables include credit to other firms, called trade credit, and credit granted consumers, called consumer credit. So, receivables obviously represent a major investment of financial resources.

Components of credit policy

If a firm decides to grant credit to its customers, then it must establish procedures for extending credit and collecting. In particular, the firm will have to deal with the following components of credit policy:

1. **Terms of sale:** The terms of sale establish how the firm proposes to sell its goods and services. A basic decision is whether the firm will require cash or will extend credit. If the firm does grant credit to a customer, the terms of sale will specify (perhaps implicitly) the credit period, the cash discount and discount period, and the type of credit instrument.
2. **Credit analysis:** In granting credit, a firm determines how much effort to expend trying to distinguish between customers who will pay and customers who will not pay. Firms use a number of devices and procedures to determine the probability that customers will not pay; put together, these are called credit analysis.
3. **Collection policy:** After credit has been granted, the firm has the potential problem of collecting the cash, for which it must establish a collection policy.

The investment in Receivables

The investment in accounts receivable for any firm depends on the amount of credit sales and the average collection period. For example, if a firm's average collection period, ACP, is 30 days, then, at any given time, there will be 30 days' worth of sales outstanding. If credit sales run $1,000 per day, the firm's accounts receivable will then be equal to 30 days * $1,000 per day = $30,000, on average.

As our example illustrates, a firm's receivables generally will be equal to its average daily sales multiplied by its average collection period:

Accounts receivable = Average daily sales * ACP

Thus, a firm's investment in accounts receivable depends on factors that influence credit sales and collections.

Concept Questions

4.1a What are the basic components of credit policy?

4.1b What are the basic components of the terms of sale if a firm chooses to sell on credit?

4.2. Terms of the Sale

Within a given industry, the terms of sale are usually fairly standard, but these terms vary quite a bit across industries. In many cases, the terms of sale are remarkably archaic and literally date to previous centuries.

The basic form of Terms of the Sale

The easiest way to understand the terms of sale is to consider an example. Terms such as 2/10, net 60 are common. This means that customers have 60 days from the invoice date to pay the full amount; however, if payment is made within 10 days, a 2 percent cash discount can be taken.

Consider a buyer who places an order for $1,000, and assume that the terms of the sale are 2/10, net 60. The buyer has the option of paying $1,000 × (1 — .02) = $980 in 10 days, or paying the full $1,000 in 60 days. If the terms are stated as just net 30, then the customer has 30 days from the invoice date to pay the entire $1,000, and no discount is offered for early payment.
In general, credit terms are interpreted in the following way:

<take this discount off the invoice price> / <if you pay in this many days>,
<else pay the full invoice amount in this many days>

Thus, 5/10, net 45 means take a 5 percent discount from the full price if you pay within 10 days, or else pay the full amount in 45 days.

The credit period

The **credit period** is the basic length of time for which credit is granted. The credit period varies widely from industry to industry, but it is usually between 30 and 120 days. If a cash discount is offered, then the credit period has two components: the net credit period and the cash discount period.

The net credit period is the length of time the customer has to pay. The cash discount period is the time during which the discount is available. With 2/10, net 30, for example, the net credit period is 30 days and the cash discount period is 10 days.

The Invoice Date: The invoice date is the beginning of the credit period. An **invoice** is a written account of merchandise shipped to the buyer. For individual items, by convention, the invoice date is usually the shipping date or the billing date, *not* the date on which the buyer receives the goods or the bill.

Many other arrangements exist. For example, the terms of sale might be ROG, for *receipt of goods.* In this case, the credit period starts when the customer receives the order. This might be used when the customer is in a remote location. With EOM dating, all sales made during a particular month are assumed to be made at the end of that month. This is useful when a buyer makes purchases throughout the month, but the seller bills only once a month.

Length of the Credit Period: Several factors influence the length of the credit period. Two important ones are the *buyer's* inventory period and operating cycle. All else equal, the shorter these are, the shorter the credit period will be.

There are a number of other factors that influence the credit period. Many of these also influence our customer's operating cycles; so, once again, these are related subjects. Among the most important are these:

- ✓ **Perishability and collateral value:** Perishable items have relatively rapid turnover and relatively low collateral value. Credit periods are thus shorter for such goods. For example, a food wholesaler selling fresh fruit and produce might use net seven days. Alternatively, jewelry might be sold for 5/30, net four months.
- ✓ **Consumer demand:** Products that are well established generally have more rapid turn-over. Newer or slow-moving products will often have longer credit periods associated with them to entice buyers. In addition, as we have seen, sellers may choose to extend much longer credit periods for off-season sales (when customer demand is low).
- ✓ **Cost, profitability, and standardization:** Relatively inexpensive goods tend to have shorter credit periods. The same is true for relatively standardized goods and raw materials. These all tend to have lower markups and higher turnover rates, both of which lead to shorter credit periods. However, there are exceptions. Auto dealers, for

example, generally pay for cars as they are received.

- ✓ **Credit risk:** The greater the credit risk of the buyer, the shorter the credit period is likely to be (if credit is granted at all).
- ✓ **Size of the account:** If an account is small, the credit period may be shorter because small accounts cost more to manage, and the customers are less important.
- ✓ **Competition:** When the seller is in a highly competitive market, longer credit periods may be offered as a way of attracting customers.
- ✓ **Customer type:** A single seller might offer different credit terms to different buyers. A food wholesaler, for example, might supply groceries, bakeries, and restaurants. Each group would probably have different credit terms. More generally, sellers often have both wholesale and retail customers, and they frequently quote different terms to the two types.

Cash discounts

One reason discounts are offered is to speed up the collection of receivables. This will have the effect of reducing the amount of credit being offered, and the firm must trade this off against the cost of the discount. Notice that when a cash discount is offered, the credit is essentially free during the dis- count period. The buyer pays for the credit only after the discount expires. With 2/10, net 30, a rational buyer either pays in 10 days to make the greatest possible use of the free credit or pays in 30 days to get the longest possible use of the money in exchange for giving up the discount. By giving up the discount, the buyer effectively gets 30 — 10 = 20 days' credit.

Another reason for cash discounts is that they are a way of charging higher prices to customers that have had credit extended to them. In this sense, cash discounts are a convenient way of charging for the credit granted to customers.

Cost of the Credit: In our examples, it might seem that the discounts are rather small. With 2/10, net 30, for example, early payment gets the buyer only a 2 percent discount. Does this provide a significant incentive for early payment? The answer is yes because the implicit interest rate is extremely high. To see why the discount is important, we will calculate the cost

to the buyer of not paying early. To do this, we will find the interest rate that the buyer is effectively paying for the trade credit.

Trade Discounts: In some circumstances, the discount is not really an incentive for early payment but is instead a trade discount, a discount routinely given to some type of buyer. For example, with our 2/10th, EOM terms, the buyer takes a 2 percent discount if the invoice is paid by the 10th, but the bill is considered due on the 10th, and overdue after that. Thus, the credit period and the discount period are effectively the same, and there is no reward for paying before the due date.

The Cash Discount and the ACP: To the extent that a cash discount encourages customers to pay early, it will shorten the receivables period and, all other things being equal, reduce the firm's investment in receivables.

Credit instruments

The credit instrument is the basic evidence of indebtedness. Most trade credit is offered on open account. This means that the only formal instrument of credit is the invoice, which is sent with the shipment of goods and which the customer signs as evidence that the goods have been received. Afterward, the firm and its customers record the exchange on their books of account.

At times, the firm may require that the customer sign a promissory note. This is a basic IOU and might be used when the order is large, when there is no cash discount involved, or when the firm anticipates a problem in collections. Promissory notes are not common, but they can eliminate possible controversies later about the existence of debt.

One problem with promissory notes is that they are signed after delivery of the goods. One way to obtain a credit commitment from a customer before the goods are delivered is to arrange a commercial draft. Typically, the firm draws up a commercial draft calling for the customer to pay a specific amount by a specified date. The draft is then sent to the customer's bank with the shipping invoices.

If immediate payment is required on the draft, it is called a sight draft. If immediate payment is not required, then the draft is a time draft. When the draft is presented and the buyer "accepts" it, meaning that the buyer promises to pay it in the future, then it is called a trade

acceptance and is sent back to the selling firm. The seller can then keep the acceptance or sell it to someone else. If a bank accepts the draft, meaning that the bank is guaranteeing payment, then the draft becomes a banker's acceptance. This arrangement is common in international trade, and banker's acceptances are actively traded in the money market.

Concept Questions

4.2a What considerations enter the determination of the terms of sale?
4.2b Explain what terms of "3/45, net 90" mean. What is the effective interest rate?

4.3. Analyzing Credit Policy

In this section, we take a closer look at the factors that influence the decision to grant credit. Granting credit makes sense only if the NPV from doing so is positive. We thus need to look at the NPV of the decision to grant credit.

Credit policy effects

In evaluating credit policy, there are five basic factors to consider:

1. **Revenue effects:** If the firm grants credit, then there will be a delay in revenue collections as some customers take advantage of the credit offered and pay later. However, the firm may be able to charge a higher price if it grants credit and it may be able to increase the quantity sold. Total revenues may thus increase.
2. **Cost effects:** Although the firm may experience delayed revenues if it grants credit, it will still incur the costs of sales immediately. Whether the firm sells for cash or credit, it will still have to acquire or produce the merchandise (and pay for it).
3. **The cost of debt:** When the firm grants credit, it must arrange to finance the resulting receivables. As a result, the firm's cost of short-term borrowing is a factor in the decision to grant credit.
4. **The probability of nonpayment:** If the firm grants credit, some percentage of the credit buyers will not pay. This can't happen, of course, if the firm sells for cash.
5. **The cash discount:** When the firm offers a cash discount as part of its credit terms, some customers will choose to pay early to take advantage of the discount.

Evaluating a proposed credit policy

To illustrate assume a firm is currently selling a product at Br. 10 per unit. The most recent annual sales (all credit) were 30,000 units. The variable cost per unit is Br. 6 and the average cost per unit, given sales volume of 30,000 units, is Br. 8. The total fixed cost is Br. 60,000.

The average collection period may be assumed to be 30 days.

The firm is thinking a relaxation of credit standards that expected to result in a 15% increase in unit sales; the average collection period would increase to 45 days with no change in uncollectible expenses. It is also expected that increased sales will result in additional networking capital to the extent of Br. 10,000. The increase in collection expense may be assumed not be negligible. The required return on investment is 15 percent.

Required: Should the firm relax the credit standard? What should be the accounts receivable turnover, total cost of sales, average investment in accounts receivables, the cost of marginal investments in accounts receivable, and the cost of working capital in present and proposed plans**?**

When you face such types of problems: i) determine the additional benefit, ii) determine the additional costs, and iii) compare the additional benefits with additional costs that is a) if the additional benefit is greater than the additional cost accept the new proposal b) if the additional cost is greater than the benefit the reject the new proposal.

i) Incremental/additional/ benefits

You can find incremental benefits either (a) by calculating the costs and profits on both the existing and new proposal or (b) by calculating the profit on sales by an amount equal to the product of the increase in units and contribution margin per unit.

a) Proposed plan:

Sales revenue (34,500 x 10)	Br. 345,000
Less: variable costs (34,500 x 6)	207,000
Contribution margin	Br. 138,000
Less: fixed cost	60,000
Operating profit from sales (A)	Br. 78,000

Current Plan:

Sales revenue (30,000 x 10)	Br. 300,000
Less: variable costs (30,000 x 6)	180,000
Contribution margin	Br. 120,000
Less: fixed cost	60,000
Operating profit from sales (B)	Br. 60,000
i) Incremental profit (A-B)	Br. 18,000

or

b) Short Cut Method

Incremental profit = Increase in unit x contribution per unit

= 4,500 x Br. 4

= Br. 18,000

Note that the increase in unit sales is computed as:

30,000 x 0.15 = Br.4,500

And Br. 4 is the difference between the selling price and the variable cost per unit i.e., 10- 6 = Br.4

ii) Incremental costs

a) Cost of marginal / incremental investment in receivables: This is the difference between the cost of carrying receivables before and after the proposed relaxation in credit standards. It can be computed as follows: **Turnover of account receivable**

Proposed plan: $\frac{\text{Number of days in the year}}{\text{Average collection period}} = \frac{360}{45} = 8$

Current plan: $\frac{\text{Number of days in the year}}{\text{Average collection period}} = \frac{360}{30} = 12$

Total cost of sales

Proposed plan: Variable cost + fixed cost = 207,000 + 60,000 = Br. 267,000

Current Plan: Variable cost + Fixed cost = 180,000 + 60,000= Br.240,000

Average investment in receivables

Proposed plan: 267,000/8 = Br.33,375

Current Plan: 240,000/12 = Br.20,000

The marginal increase in receivables

Average investment in receivables under the proposed plan	Br. 33,375
Less: Average investment in receivables under the current plan	Br. 20,000
Marginal investment	Br. 13,375

Marginal cost as a result of the opportunity cots of tied up receivables at 15 percent rate of return is: 13,375 x 0.15 = Br. **2,006.25**

There is also cost of working capital because working capital is increased by 10,000 birr as a result of the proposed plan.

Cost of working capital = 10,000 x 0.15 = Br**. 1,500**

Hence, incremental profit = 18,000

Incremental cots = 2006.25 + 1,500 = **Br. 3506.25**

Incremental benefit is greater than the incremental cost by Br. 14,493.25 (18,000 - 3506.25)

Decision: The firm has to institute the new proposal.

4.4. Credit Analysis

Thus far, we have focused on establishing credit terms. Once a firm decides to grant credit to its customers, it must then establish guidelines for determining who will and who will not be allowed to buy on credit. ***Credit analysis*** refers to the process of deciding whether or not to extend credit to a particular customer. It usually involves two steps: gathering relevant information and determining creditworthiness. Credit analysis is important simply because potential losses on receivables can be substantial. Companies report the amount of receivables they expect not to collect on their balance sheets. .

When should credit be granted?

Imagine that a firm is trying to decide whether or not to grant credit to a customer. This decision can get complicated. For example, note that the answer depends on what will happen if credit is refused. Will the customer simply pay cash? Alternatively, will the customer not make the purchase at all? To avoid being bogged down by this and other difficulties, we will use some special cases to illustrate the key points.

A One-Time Sale: We start by considering the simplest case. A new customer wishes to buy one unit on credit at a price of ***P*** per unit. If credit is refused, the customer will not make the purchase.

Furthermore, we assume that, if credit is granted, then, in one month, the customer will either pay up or default. The probability of the second of these events is π. In this case, the probability **(π)** can be interpreted as the percentage of *new* customers who will not pay. Our business does not have repeat customers, so this is strictly a one-time sale. Finally, the required return on receivables is ***R*** per month, and the variable cost is ***v*** per unit. The analysis here is straightforward. If the firm refuses credit, then the incremental cash flow is zero.

If it grants credit, then it spends *v* (the variable cost) this month and expects to collect (1- π) P next month. The NPV of granting credit is:

NPV = - v + (1 - π) P/(1 + R)

To illustrate the NPV of granting credit, suppose the following for firm:

P = $49

V = $20

For example, for firm, this NPV is: NPV = - $20 + (1 - π) × 49/1.02

With, say, a 20 percent rate of default, this works out to be:

NPV = - $20 + .80 × 49/1.02 = $18.43

Therefore, credit should be granted. Because, the NPV is greater than zero. Notice that we have divided by (1 + R) here instead of by R because we now assume that this is a one-time transaction.

Our example illustrates an important point. In granting credit to a new customer, a firm risks its variable cost (v). It stands to gain the full price (P). For a new customer, then, credit may be granted even if the default probability is high. For example, the break-even probability in this case can be determined by setting the NPV equal to zero and solving for π:

NPV = 0 = - $20 + (1 - π) × 49/1.02

1 - π = $20/49 × 1.02

π = 58.4%

Locust should extend credit as long as there is a 1 - .584 = 41.6% chance or better of collecting. This explains why firms with higher markups tend to have looser credit terms.

This percentage (58.4%) is the maximum acceptable default probability for a new customer. If a returning, cash-paying customer wanted to switch to a credit basis, the analysis would be different, and the maximum acceptable default probability would be much lower. The important difference is that, if we extend credit to a returning customer, we risk the total sales

price (P), because this is what we collect if we do not extend credit. If we extend credit to a new customer, we risk only our variable cost.

Repeat Business: A second, very important factor to keep in mind is the possibility of repeat business. We can illustrate this by extending our one-time sale example. We make one important assumption: A new customer who does not default the first time around will remain a customer forever and never default.

If the firm grants credit, it spends v this month. Next month, it gets nothing if the customer defaults or it gets P if the customer pays. If the customer pays, then the customer will buy another unit on credit and the firm will spend v again. The net cash inflow for the month is thus P – v. In every subsequent month, this same P - v will occur as the customer pays for the previous month's order and places a new one.

It follows from our discussion that, in one month, the firm will receive \$0 with probability π. With probability $(1 - \pi)$, however, the firm will have a permanent new customer. The value of a new customer is equal to the present value of (P – v) every month forever:

$PV = (P - v)/R$

The NPV of extending credit is therefore:

$NPV = - v + (1 - \pi)(P - v)/R$

For the firm, this is:

$NPV = - \$20 + (1 - \pi) \times (49 - 20)/.02$

$= - \$20 + (1 - \pi) \times 1{,}450$

Even if the probability of default is 90 percent, the NPV is:

$NPV = - \$20 + .10 \times 1{,}450 = \$125$

The firm should extend credit unless default is a virtual certainty. The reason is that it costs only \$20to find out who is a good customer and who is not. A good customer is worth \$1,450, however, so the firm can afford quite a few defaults.

4.5. Collection Policy

Collection policy is the final element in credit policy. Collection policy involves monitoring receivables to spot trouble and obtaining payment on past-due accounts.

Monitoring receivables

To keep track of payments by customers, most firms will monitor outstanding accounts. First, a firm will normally keep track of its average collection period (ACP) through time. If a firm is in a seasonal business, the ACP will fluctuate during the year; but unexpected increases in the ACP are a cause for concern. Either customers in general are taking longer to pay, or some percentage of accounts receivable are seriously overdue.

It is often the case that accounts beyond a certain age are almost never collected. Monitoring the age of accounts is very important in such cases. Firms with seasonal sales will find the percentages on the aging schedule changing during the year. For example, if sales in the current month are very high, then total receivables will also increase sharply. This means that the older accounts, as a percentage of total receivables, become smaller and might appear less important. Some firms have refined the aging schedule so that they have an idea of how it should change with peaks and valleys in their sales.

Collection effort

A firm usually goes through the following sequence of procedures for customers whose payments are overdue:

1. It sends out a delinquency letter informing the customer of the past-due status of the account.
2. It makes a telephone call to the customer.
3. It employs a collection agency.
4. It takes legal action against the customer.

At times, a firm may refuse to grant additional credit to customers until arrearages are cleared up. This may antagonize a normally good customer, which points to a potential conflict between the collections department and the sales department. In probably the worst case, the

customer files for bankruptcy. When this happens, the credit-granting firm is just another unsecured creditor. The firm can simply wait, or it can sell its receivable.

Summary

Account receivable represents an extension of credit to customers. Firms create account receivables when they provide goods and services by granting credit.

Analysis the trade–off between the costs and benefits of extension of credits is the overall objective of receivable management. The major categories of costs accounts receivables are the collection costs, capital costs, and default and delinquency costs.

The components of credit policy: We discussed the terms of sale, credit analysis, and collection policy. Under the general subject of terms of sale, the credit period, the cash discount and discount period, and the credit instrument were describe

Credit policy analysis: We developed the cash flows from the decision to grant credit and showed how the credit decision can be analyzed in an NPV setting. The NPV of granting credit depends on five factors: revenue effects, cost effects, the cost of debt, the probability of nonpayment, and the cash discount.

Credit analysis: We looked at the decision to grant credit to a particular customer. We saw that two considerations are very important: the cost relative to the selling price and the possibility of repeat business.

Collection policy: Collection policy determines the method of monitoring the age of accounts receivable and dealing with past-due accounts. We described how an aging schedule can be prepared and the procedures a firm might use to collect on past-due accounts.

Self-Test Activities

I. Multiple Choices

1. _____ is the process of decision making relating to the investment of funds in receivables.

    a) Credit policy

    b) Credit term

    c) Receivable management

    d) Objective of receivable

    e) None

2. Firms sell goods and deliver services on credit at least for one of the following reasons.

    a) To deal with suppliers

    b) To decrease sales volume

    c) To avoid loss of sales by competitors

    d) Simple credit sales is their demand

    e) None

3. When funds are tied up in receivables firms mainly incur one of the following costsa) Capital cost

    b) Default cost

    c) Collection cost

    d) Administrative cost

    e) None

4) _____ is the benefit of liberal credit policy.

    a) Sales expansion

    b) Customer retention

c) Larger outstanding account receivables

d) Increase in profitability

e) All

f) None

5.A firm has increased its average collection period from a certain figure to another. What will be the consequence of the increase?

f) Increase in capital cost

g) Increase in average investment in account receivables

h) Decrease in account receivable turnover

i) All

j) None

6. A merchandizing enterprise initiates to declare cash discount starting the following month.

What do you expect from the decision, given other factor are constant?

a) Sales volume increases so that positive impact on profit

b) Average collection period increases so that a positive impact on profit

c) Uncollectible account expenses increase so that a positive impact on profit

d) Sales volume decreases so that a positive impact on profit

e) All

f) None

GIRMA Ltd. has presented you the following information.

Credit sales at current level is Br.200, 000; annual operating fixed cost is Br.40,000 and current level of variable cost is Br.80,000. GIRMA Ltd. now contemplates to increase the average collection period from **30 days to 60 days**. As a result of the increase in the

collection period the firm's credit sale increases to Br. 275,000 and the variable cost increases by the same percent of increase in sales. The firm has **20 percent** rate of return on investments and a year is assumed to have **360 days**.

Use the information given above to answer question **7 to 10**

7. The average investment tied up in receivables after the increase in the collection period is:

   a) Br. 20,000 b) Br. 25,000 c) Br.10,000 d) Br.150,000 e)none

8. The opportunity cost of the firm resulted from the tied up balance on increase in collection period is a) Br. 3,200 b) Br. 30,000 c) Br.32,000 d) Br.3,000 e)none

9. Which one of the following is not true?

   a) The average turnover of receivable before increase in collection period is 6 times

   b) The total cost of sales after increase in receivable is Br.120,000

   c) Marginal increase in account receivable investment is Br.32,000

   d) All

   e) None

10. The increase in variable cost is:

   a) Br. 75, 000

   b) Br.30,000

   c) Br. 40,000

   d) Br.80,000

   e) None

II. Self-Test Problems

1. Suppose, a firm is contemplating an increase in the credit period from 30 to 60 days, the average collection period which is at present 45 days is expected to increase to 75 days. It is also likely that the uncollectible expenses will increase from the current level of 1 percent to 3 percent of sales. Total credit sales re expected to increase from the level of 30,000 units to 34,500 units. The present average cost per unit is Br. 8, the variable cost and sales per unit are Br. 6 and Br. 10 per unit respectively. Assume the firm expects a rate of return of 15 percent. Should the firm extend the credit period?

2. A firm is contemplating stricter collection policies. The following details are available:

i. At present, the firm is selling 36,000 units on credit at a price of Br. 32 each; the variable cost per unit is Br. 25 per unit the average cost per unit is Br. 29; average collection period is 58 days; and collection expenses amount to Br. 10,000; uncollectible are 3 percent.

ii. If the collections procedures are tighten, collection expenses will be increased to Br. 30,000, uncollectible expenses will be decreased by 2 percent; the collection period will be 40 days; sales volume is likely to decline by 500 units. Assume a 20% rate of return on investment, should the firm implement the new decision?

CHAPTER FIVE
INVENTORY MANAGEMENT

Introduction

Dear reader! This is the last chapter of the module. In the last two chapters, you have seen the two most important part of working capital management. Inventories constitute part of the current asset section of most firms particularly manufacturing and merchandizing enterprises. Like receivables, inventories represent a significant investment for many firms. Because firms maintain large size of inventory, it is imperative to manage inventories efficiently and effectively in order to avoid unnecessary investments. A firm neglecting the management of inventories will be jeopardizing its long run profitability and may fail ultimately.

Chapter Outline

5.1. Introduction

5.2. Meaning & Nature of inventory

5.3. Benefits & costs of Holding Inventory

5.4. Inventory management techniques

Chapter Summary

Self-Test Activities

Chapter Objectives

After you complete studying the chapter, you will be able

- ✓ To Identify the need for inventory management
- ✓ To Illustrate carrying cost incurred for holding inventories
- ✓ To Illustrate the acquisition cost of inventories Determine the optimum order quantity for firm
- ✓ To Illustrate the nature of stock level and the need for safety stock

5.1. Introduction

Inventory, as a current asset, differs from other current assets because only financial managers are not involved. Rather, all the functional areas finance, marketing, production, and purchasing, are involved. The views concerning the appropriate level of inventory would differ among the different functional areas. The job of the financial manager is to reconcile the conflicting viewpoints of the various functional areas regarding the appropriate inventory levels in order to fulfill the overall objectives of maximizing the owner's wealth. It is in such contexts that this chapter is devoted to the main element of inventory management from the viewpoint of financial manager.

5.2. Meanings and Nature of Inventories

For manufacturing companies, inventories are stock of the product a company is producing for sale and components that make up the product. The various forms that inventories exist in a manufacturing company are normally classified into three categories.

The first category is raw material. This is whatever the firm uses as a starting point in its production process. Raw materials might be something as basic as iron ore for a steel manufacturer, pure cotton for a textile manufacturer, crude oil for Petroleum Company and so on.

The second type of inventory is work-in-progress, which is just what the name suggests as unfinished products. They represent products that need more work before they become finished products for sale. How big this portion of inventory depends on the length of the production process. For Petroleum Company and an airframe manufacturer, for example, work-in-progress can be substantial.

The third final type of inventory is finished goods, that is, products ready for shipment or for sale. They are completely manufactured products.

A merchandizing enterprise will have a very high level of finished goods inventory and no raw material and work- in- process inventory. The other type of inventory that is maintained by firms is the supplies inventory. Supplies include office and plant cleaning

materials like soap, brooms, oil, fuel, etc

There are at least two things to keep in mind concerning inventory types. First, the names for the different types can be little misleading because one company's raw material could be another's finished goods. For example, to a steel manufacturer, iron ore would be a raw material, and steel would be the final product. An auto body sheet stamping operation will have steel as its raw material and auto body sheets as its finished goods and an automobile assembler will have body sheets as raw materials and automobiles as finished products.

The second thing to keep in mind is that the various types of inventory can be quite different in terms of their liquidity. Raw materials that are commodity like or relatively standardized can be easy to convert into cash. Work-in-progress, on the other hand, can be quite illiquid and have little more than scrap value. As always, the liquidity of finished goods depends on the nature of the product.

Quick Check

What is the difference between inventory for manufacturing firms and inventory for merchandizing firms?

Objectives of Inventory Management

In the context of inventory management, a firm may be challenged with the problem of meeting two conflicting needs: i) to minimize investment in inventory and ii) to meet a demand for a product by efficiently organizing the production and sales operations. These two conflicting objectives of inventory management can also be expressed in terms of cost and benefit associated with inventory. The firm should minimize investment in inventory implies that maintaining inventory involves cost, such that the smaller is the inventory, the lower is the cost. But inventory also provide benefits to the extent that they facilitate the smooth functioning of the firm: the larger the inventory, the better it is from this viewpoint. An optimal level of inventory should be determined on the basis of the trade-off between costs and benefits associated with the level of inventory

5.3.Benefits & costs of Holding Inventory

A. Costs Holding inventory

One operating objective on inventory management is to minimize costs. Excluding the cost of merchandize, the cost associated with inventory fall into two basic categories.

Ordering Costs This category of cost is associated with the acquisition of or ordering of inventory. Firms have to place orders with suppliers to replenish inventory of raw materials or merchandizing items. The expenses involved are referred to as ordering costs. Included in ordering costs are:

i. Costs involved in preparing the purchase order requisition form, and

ii. Receiving, inspecting and recording the goods received to ensure both quality and quantity.

The cost of acquiring material consists of clerical costs and cost of stationery. They are also called set up costs. They are generally fixed per order placed, irrespective of the amount of order. The more frequent the acquisition of the inventory made, the higher are such costs. From a different perspective, the fewer are the acquisition frequency, the smaller/ lower are the order costs.

Carrying Costs These costs are involved in maintaining and carrying inventory. Included in carrying costs can be categorized as:

1. **Costs arise due to storing of inventory** Under this group of carrying cost are: the storage costs, insurance, technical obsolescence labor for handing inventory, clerical and accounting costs are found.
2. **The opportunity cost of funds** This consists of expenses in raising funds that is interest on capital to finance the acquisition of inventories. This is with the assumption that if funds were not tied up in inventory, they would have earned return.

The carrying costs and the inventory size are positively related and move in the same direction. If the level of inventory increases, the carrying costs also increase and *vice versa.*

Quick Check

Mention some examples of opportunity costs resulted from holding inventories.

B. Benefits of Holding Inventory

The second element in the optimum inventory decision deals with the benefits associated with holding inventory. The major benefits of holding inventory are the basic functions of inventory. The basic function of inventories is to act as a buffer to decouple or uncouple the various activities of a firm so that all do not have to be pursued at exactly the same rate. The activities are purchasing, production and selling. The term uncoupling is to mean that these interrelated activities of a firm can be carried on independently. Without inventories, purchasing and production would be completely controlled by the sales schedules. If the sales of a firm increase, these two would also increase and *vice versa.* In other worlds, purchasing and production would depend upon the level of sales. It is of course, true that in the long run, the purchasing and production activities are and, in fact should be tied to the sales activity of a firm. Nevertheless, in the short run they are rigidly related, the three key activities cannot be carried out efficiently. Inventories permit short-term relaxation so that each activity may be pursued efficiently. Stated differently, inventories enable firms in the short run to produce at a rate greater than purchase of raw material and *vice versa*, or to sell at a rate greater than production and *vice versa*.

Since inventory enables uncoupling the key activities of a firm, each of them can be operated at the most efficient rate. This has several beneficial effects on the firm's operations. In other words, the three types of inventories, raw materials, work- in- process and finished goods, perform certain useful functions. Alternatively, rigid tying (coupling) of purchase and production to sales schedules is undesirable in the short run as it will deprive the firms of certain benefits.

5.4. Inventory Management Techniques

The following are some simple production – oriented methods of inventory control to indicate a broad framework for managing inventories efficiently in conformity with the goal of wealth maximization. The major problem areas that comprise the heart of inventory control and techniques for respective problem are indicated below

Inventory Control Problem Area	**Inventory Management Techniques**
The classification problem to determine the type of control required	The A B C Approach
The Order Quantity Problem	The Economic Order Quantity Model (EOQ model)
Safety Stock Problem	Safety Stock Estimation
The Order Point Problem	Reorder Points Estimation

The A B C Approach

The ABC approach is a simple approach to inventory management where the basic idea is to divide inventory into three (or more) groups. The underlying rationale is that a small portion of inventory in terms of quantity might represent a large portion in terms of inventory value. For example, this situation would exist for a manufacturer that uses some relatively expensive, high-tech components and some relatively inexpensive basic material in producing its products.

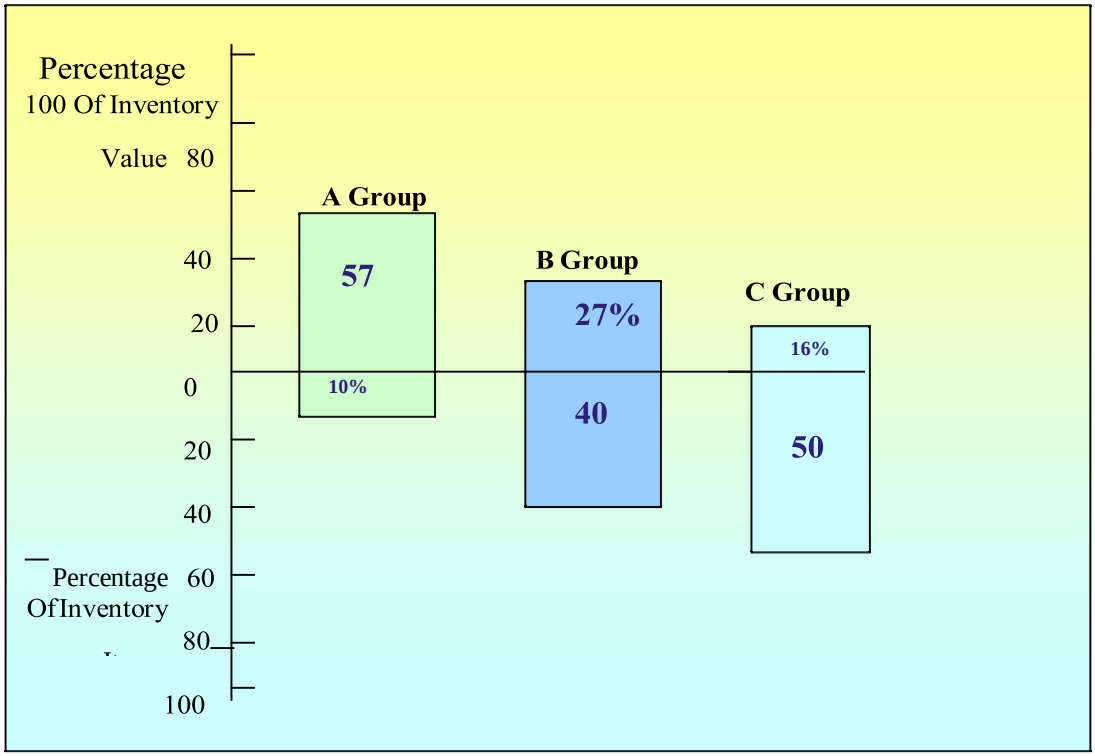


Figure 5.1 an ABC Approach

Figure 5.1 illustrates an A B C comparison of items in terms of the percentage of inventory value represented by each group versus the percentage of items represented

In the figure, the 'A' group constitutes only 10% of inventory by item count, but it represents over half of the value of inventory. The 'A' group items are thus monitored closely, and inventory levels are kept relatively low.

At the other end, basic inventory items will also exist, but because these are crucial and inexpensive, large quantities are ordered and kept on hand. These would be 'C' group items. The 'B' group is made up of in-between items of group 'A' and 'C'.

The Economic Order Quantity Model (EOQ Model)

An important criterion for an efficient system of stores control is to ensure that there is no overstocking or under-stocking. Overstocking has many disadvantages in addition to increasing costs. Under-stocking may make firms stop production. Thus, an optimum quantity (i.e., neither less nor more) of material should be ordered and stocked. This optimum quantity also called economic order quantity (EOQ). EOQ is most economic quantity, which should be ordered each time when fresh supplies required.

The EOQ model is the best-known approach to explicitly establishing an optimal inventory level. The basic idea is illustrated in the following Figure 8.2, which plots the various costs associated with holding inventory (on Y – axis) against inventory levels (on X – axis).

In Figure 5.2, line of ordering costs (restocking costs) has been shown sloping downward which indicates that costs will decline when large quantity is purchased. Again the line of inventory carrying cots is going upwards which indicates that costs will increase when holding larger stocks. EOQ is at a point where total cost curve is at its lowest.

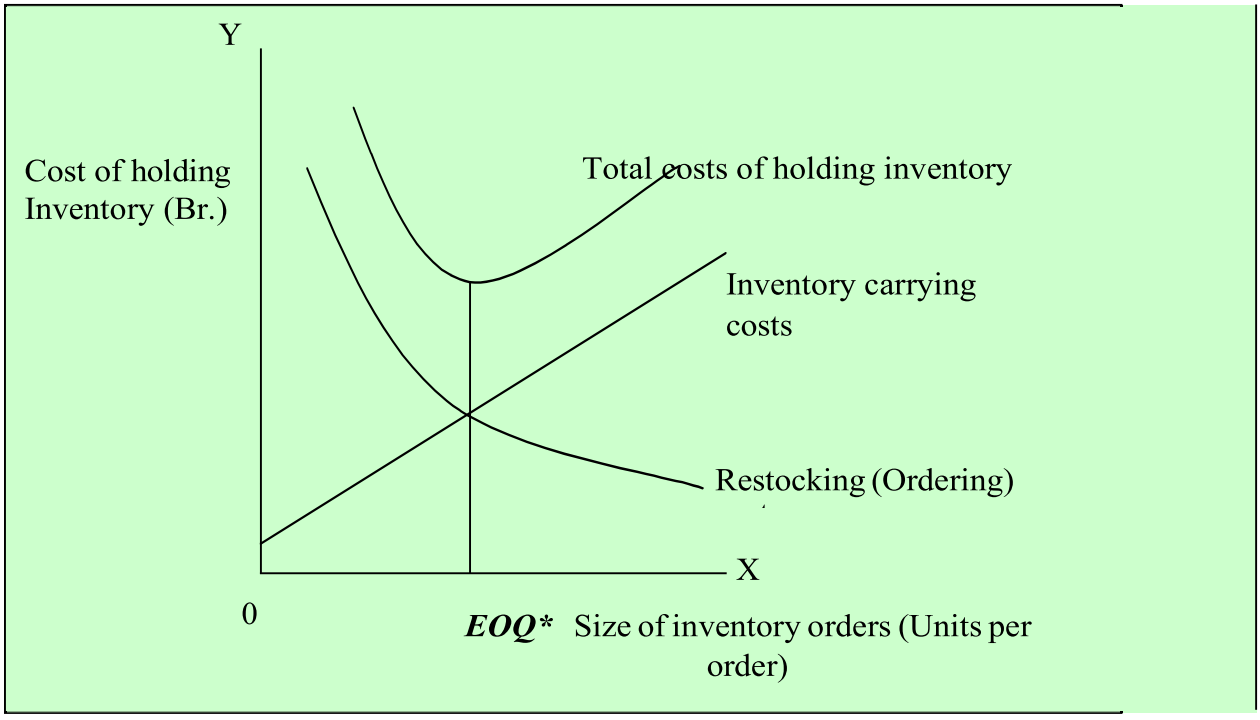


Figure.5.2. EOQ Model Graphically

EOQ represents that size of the order for which total cost of ordering and the cost of carrying inventory will be minimum.

Carrying and ordering costs to be considered in EOQ determination (a summary)

Ordering Costs (Restocking) Costs	**Carrying Costs**
• Cost of ordering includes cost of placing an order, cost of chasing orders, transportation and receiving cost, setting up of production run, etc. • Ordering costs are partly fixed and partly variable. The become variable with the number of orders	• Cost of carrying stock consists of rent of warehouse and other costs of storage, audit and stocktaking cost, risks of obsolescence, losses and theft, salaries of store staff, interest on capital tied up, insurance, handling costs, security cots etc., • Carrying costs are variable with the amount of orders. If purchases are made in huge quantities, inventory-carrying costs will increase.

If the order size is small, ordering cost will increase. Hence, carrying cost and ordering cost move in opposite direction. The saving in one type of cost may be more than offset by the rise in the other set of cost. Hence, it is necessary to determine that order quantity for which the aggregate of the two costs is to the minimum.

The formula used for determining EOQ is as follows:

$$Q = EOQ = \sqrt{\frac{2}{AxR}}$$

Where, A = Total annual requirement or consumption (in units)

R = Cost of Ordering per Order (Restocking costs per order) CC = Carrying Costs per Unit.

The formula for EOQ is derived as follows

Total Inventory Carrying costs = Average Inventory X Carrying costs per unit

$$= \frac{Q}{2} XCC \text{.....(1)}$$

Total Ordering Costs = No of Orders X Ordering Cost per Order

$$= \frac{A}{Q} XR \text{.....(2)}$$

Therefore, Total Costs = Total Carrying Costs + Total Order Cost

(1) + (2)

$$= \frac{Q}{2} XCC + \frac{A}{Q} XR \quad \text{.....(3)}$$

Since, ordering cost varies inversely as Q and inventory carrying cost varies directly as Q, the total annual cost will be minimum when total carrying costs and total ordering costs are equal i.e., (1) = (2)

Total Carrying Costs = Total Order Costs

$$\frac{Q}{2} XCC = \frac{A}{Q} XR$$

$$Q^2 * CC = 2AR$$

$$Q2 = \frac{2AR}{CC}$$

$$Q = \text{EOQ} = \frac{\sqrt{2\text{xAxR}}}{\text{cc}}$$

Limitations of EOQ Model The EOQ Model is limited from the following angles.

- The assumption of constant consumption and the instantaneous replenishment of inventories are of doubtful validity.
- There may be an unusual and unexpected demand for stocks. To meet such contingencies, firms have to keep additional, inventories, which are known as ***Safety Stocks.***

- Another weakness of EOQ model is that the assumption of a known annual demand for inventories is doubtful.
- In additional to above all, there are some computational problems involved.

Illustration

The following details are available in respect of Yigermal Company

1) Annual requirement of inventory is 40,000 units
2) Cost per unit (other than carrying and ordering costs) is Br. 16
3) Carrying costs are likely to be 15per cent of cost per unit per year
4) Cost of placing order is Br. 480 per order

What is the Economic Order Quantity level of Yigermal Company?

Solution

$EOQ = \frac{\sqrt{2x40,000x480}}{2.4} = 4{,}000$ **units**

C = Br.16 x 0.15 = 2.40

Stock Levels

Stock levels should be fixed in such a way that there is no over-stocking, so the loss due to damage, deterioration in quality, risk of obsolescence, etc is minimum and capital is not blocked or interest on borrowed funds is not paid unnecessarily. Again, there shall not be under-stocking or stock-out situation, which may cause production hold-ups and loss of sale and profit.

The production planning and control or material control department controls stock by fixing **maximum**, **minimum, reordering level** and **reorder quantity** for each stock item. These levels are noted in the bin card, the storekeeper sends requisition to the purchases department for replenishment of stock as, and when the quantity of an item touches the reorder level. These levels are not permanent and revised when the consumption of material, availability of fund, etc, change. Production and sales department wants more stocks and finance department wants low stocks.

Reorder Stock Level: The EOQ technique determines the size of an order to acquire inventory so as to minimize the carrying as well as the ordering costs. Another important concept in inventory management is when to place an order of procurement. This aspect of inventory management is covered under the reorder point problem.

The reorder point can be defined as the level of inventory when fresh order should be placed with suppliers for procuring additional inventory equal to the economic order quantity.

It is a point between the maximum level and the minimum level of stock holding at which the storekeeper initiates purchases requisition for fresh supplies of materials. The reorder level is slightly more than the minimum level of stock to guard against possible disruption in suppliers, increase in consumption due to changing demand and other factors. This level depends upon various factors, e.g., maximum consumption during *lead time*, unexpected delay in receiving fresh supply, cost of placing order, cost of storage, EOQ; minimum level and so on. In case of abnormal delay, the stock should not reach zero level. Lead-time means the time required to obtain delivery of material from date of order. The formula, which is generally used to calculate reorder level, is given below:

Reorder Stock Level = Maximum Usage X Maximum delivery time

Maximum Stock Level It represents that quantity of material beyond which the stock of any items should not generally be allowed to exceed. The main objective of fixing this level is to ensure that working capital is not blocked unnecessarily in stock. It is computed by the following formula:

Maximum Stock Level = [Reorder Stock level + Reorder Quantity] –
Minimum usage x Minimum delivery time]

Minimum Stock Level: It is that level of stock below which the stock of any item should not normally be allowed to fall. It is that level which the stocks will reach with fresh delivery of material provided that delivery is made within the reorder period and consumption is normal during the period.

Minimum Stock Level = Reorder Stock Level – (Normal Usage x Average delivery time

Average Stock Level This is the average of the maximum and the minimum. It is computed by using the formula:

Average Stock Level = ½ (Minimum Stock Level + Maximum Stock Level)

Or

Average Stock Level = Minimum Stock Level + ½ (Reorder quantity)

Illustration: Two components, A and B are, used as follows:

Normal usage	50 units each per week
Minimum usage	25 units each per week
Maximum usage	75 units each per week
Re-order quantity	A: 300 units; B: 500 units
Re-order period	A: 4 to 6 weeks; B: 2 to 4 weeks

Calculate for each component: (a) Reorder level, (b) Minimum Level, (c) Maximum Level and (d) Average Stock Level.

Solution

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a) Reorder level = maximum usage x maximum reorder period

   For component A: 75x 6 = 450 units

   For component B: 75x 4 = 300 units

b) Minimum level = reorder level – (Normal usage x average reorder period)

   For component A: 450 units – (50 units x 5 weeks) = 200 units

   For component B: 300 unit – (50 units x 3 weeks) = 150 units

c) Maximum level = Reorder level + reorder quantity – (minimum usage x reorder period)

   For component A: 450 units + 300 units– (25units x 4 weeks) = 650 units

For component B: 300 unit + 500unit – (25 units x 2 weeks) = 750 units

d) Average Stock Level = Minimum Stock Level + ½ (Reorder quantity)

For component A: 200+ 300/2 = 350 units

For component B: 150+ 500/2 = 400 units

Quick Check

1. Why firms need to determine their stock level?
2. What factors are to be considered in determining the stock level?

Safety Stock

The economic order quantity and the reorder point are explained with assumptions like constant/ fixed requirement of inventory and instantaneous replenishment of inventory. These assumptions are, however, of questionable validity in actual situations. For instance, the demand for inventory is likely to fluctuate from time to time. In particular, at certain point of time the demand may exceed the anticipated level. Similarly, the receipt of inventory from suppliers may be delayed beyond the expected lead-time. The delay may arise from strikes, floods, transportation, and other bottlenecks.

Thus, a firm would come across situations in which the actual usage of inventory is higher than the anticipated level and/or the delivery of the inventory from suppliers is delayed.

The effect of slower delivery may be a shortage of inventory. That is the firm would face stock-out situations. This in turn would disrupt the production schedule and alienate the customers. The firm would, therefore, have to keep a sufficient safety margin by having additional inventory to guard against stock-out situations. Such stocks are called *safety stocks.* Safety stocks are the minimum additional inventory to serve as a safety margin or buffer to meet unanticipated increase in usage resulting from an unusually high demand and/or an uncontrollable late receipt of incoming inventory (Khan and Jain, 2000).

Establishment of a safety stock needs the consideration of a stock-out cost on one side and the carrying cost on the other. Stock-out cost and the carrying cost are counterbalancing. A financial manger's responsibility would, therefore, be to determine the safety stock with minimum stock-out and carrying costs.

Quick Check

Define the following terms:

- Lead time
- Safety stock
- Carrying cost and stock-out costs

Chapter Summary

Inventories are part of current assets of firms. They are held for use in production and for sale in the future. For manufacturing firms, inventories include; raw materials, work-in-process and finished goods while merchandizing firms have only item for sale, which are merchandizing inventories.

The objective of inventory management consists of two counter- balancing parts, namely, to minimize investments in inventories and to meet the demand for the product by efficient production and sales operation. Operationally, the goal of inventory management is to have a trade-off between costs and benefits at different levels of inventory.

The costs of handling inventories are the carrying costs and ordering costs. The major benefits of holding inventories are in the areas of purchasing, production and sales.

The A B C approach, the EOQ model, the estimation of reorder level or stock level, and the determination of safety stock are the inventory management techniques.

Self-Test Activities

I. True or false

1. A financial manager has to give value for maximizing investment in inventory.
2. Carrying cost is fixed for firms at any time for any inventory level.
3. Work-in-process inventory is more liquid than finished goods for a manufacturing company.
4. The benefit of holding inventory is only to meet sales schedule.
5. Firms give the greatest control for group 'C' items under the A B C approach because they are larger in volume and expensive.

II. Multiple Choice

1. One of the following is carrying cost of inventory
   a) Insurance premium for goods in transit
   b) Setting up transportation cost
   c) Salaries of inventory control staff
   d) Letter writing cost for suppliers
   e) None
2. One of the following describes best the true nature of inventories
   a) Work- in-process inventory is the maximum for service giving organizations
   b) End product of one firm can be raw material for the other
   c) Raw materials are items waiting for further processing in trade enterprises
   d) All e)None
3. One of the following is true about ordering cost
   a) It is fixed regardless of the number of orders
   b) It does not care about inspection cost of items

c) It is always variable based on the level of inventory ordered

d) It is set up cost e)All

4. Identify the correct one about reorder level

   a) It determines the size of an order

   b) It determines the time for placing an order

   c) It determines the cost for placing an order

   d) It determines the amount to kept for security

   e) none

5. Under the A B C approach of inventory management, the 'A' groups are :

   a) Lower in quality but higher in quantity

   b) Higher in size and higher in quality

   c) Lower in quality and quantity

   d) Higher value items and to be lower in quantity

   e) All

6. _____ is the basic consideration of a financial manager to avoid missing customers for competitors

   a) Safety stock

   b) Normal usage

   c) EOQ

   d) Lower stock level

   e) None

III. Self Test Problems

1. Economic Enterprises require 90,000 units of certain items annually. The cost per unit is Br. 3. The cost per purchase order is Br. 300 and the inventory carrying cost is Br. 6 per year.

(a) What is the EOQ?

(b) What should the firm do if the suppliers offer discounts as detailed below:

Order Quantity	Discount
4,500 - 5,999	2%
6,000 and above	3%

2. Yilutal Plc. Uses about 60,000 valves per year and the usage is fairly constant at 5,000 per month. The valve costs Br. 2.0 per unit when bought in quantities and the carrying cost is estimated to be 20 percent of average inventory investment on an annual basis. The cost to place an order and process the delivery is Br.30. It takes 60 days to receive the delivery from the date of an order and a safety stock of 2,000 valves is required.

Determine:

a) The most economical order quantity and frequency of orders

b) The order point

c) The most economical order quantity if the vales cost Br. 3.0 each instead of Br. 2.0

Answer Key for Self-Test Exercises

Chapter One

1. c 2. d 3. b 4. d 5. A 6. d 7. e 8. d 9. c 10. c

Chapter Two

1. e 2 . b 3 . e 4. b 5. c

II. Discussion question: Refer to factors affecting working capital section page 6,7&8

III. Self-Test Problems use steps in illustrations

1. Average amount of net working capital required = Br. 4,025,000
2. Average amount of net working capital required = Br. 4,966,500
3. Average amount of net working capital required = Br. 335,625

Chapter Three

I. Multiple choices

1. d
2. a
3. d
4. b
5. b 6. d 7. c 8. b

II. Self-test problems

1. Cash Budget for a period of September – November

Months	September	October	November
Cash inflows:			
Collection of receivables (A)	Br. 80,000	Br. 76,500	Br. 78,000
Cash outflows:			
Purchase payments	Br. 42,000	Br. 38,500	Br, 37,500
On 1st date	2,900	2,900	2,950
On the 16th date	2,900	2,950	2,950
Factory expenses	4,200	5,100	6,000

Office Expenses	14,000	16,000	18,000
Commission expense	-	3,200	3,060
Fixed assets purchase	-	65,000	-
Bond payment	-	20,000	-
Total cash outflow (B)	Br. 66,000	Br. 153,650	Br. 70,460
Cash surplus (deficit) (A-B)	Br. 14,000	(Br. 77,150)	Br. 7540
Balance at Beginning	10,000	24,000	(53,150)
Balance at end of period	Br. 24,000	(Br. 53,150)	Br. 45,160

Chapter Four

I. Multiple Choices

1. c 6 . a
2. c 7. d
3. a 8. d
4. e 9. d
5. d 10. b

II. Self-Test Problems

1. Using the Short Cut Method

A) Incremental profit

Incremental profit = Increase in unit x contribution per unit

= 4,500 x Br. 4

= Br. 18,000

Note that the increase in unit sales is computed as:

34,500- 30,000= 4,500.

And Br. 4 is the difference between the selling price and the variable cost per unit i.e., 10- 6 = Br.4

B) Incremental costs

i) Cost of marginal / Incremental Investment in Receivables: This is the difference between the cost of carrying receivables before and after the proposed increase in credit period. It can be computed as follows:

Turnover of account receivable

Proposed plan: Number of days in the year/ Average collection period = 360/75 = 4.8

Current plan: Number of days in the year/ Average collection period = 360/45 = 8

Total Cost of Sales

Proposed plan:[30,000 x 8] + [4,500x6] = Br. 267,000

Current Plan: 30,000x8= Br. 240,000

Average investment in receivables

Proposed plan: 267,000/4.8 = Br. 55,625

Current Plan: 240,000/8 = Br. 30,000

The marginal increase in receivables:

Average investment in receivables under the proposed plan Br. 55,625

Less: Average investment in receivables under the current plan Br. 30,000

Marginal investment Br. 25,625

Marginal cost as a result of the opportunity cost of tied up receivables at 15 percent rate of return is: 25,625 x 0.15 = Br. 3843.75

ii) There is also additional bad debt expense

Proposed plan: (0.03 x 34,500 x 10) Br. 10,350

Current plan: (0.01 x 30,000 x 10) Br. 3,000

Additional bad debt expense (10,350- 3,000) Br. 7,350

C) Compare incremental profit with incremental costs

Incremental profit: Br. 18,000 (A)

Incremental costs: Br. 25,625 + Br. 7,350 = 11,193.75 (B)

Incremental benefit is greater than the incremental cost by Br. 6806.25 (A-B)

D) Decision: The firm has to institute the new proposal that to extend the credit period

2. Before you directly do to calculating benefits and costs, identify the components of benefits and costs.

Components of benefits are: i) decrease in bad debt expense, ii) decrease in investment of receivables

Components of costs are: i) decrease in sales volume, and ii) increase in collection cost

i. Incremental benefits:

i) Bad debt expenses

Current plan:	(0.03 x 36,000 x 32)	34,560
Proposed plan:	(0.01x 35,500 x32)	11,360
Saving in bad debt expenses	(34,560-11360)	23,200

ii) Average collection period/ investment receivable

Turnover of account receivable

Current plan: Number of days in the year/ Average collection period = 360/58 = 6.2

Proposed plan: Number of days in the yea/ Average collection period r = 360/40 = 9

Total Cost of Sales:

Current plan: 36,000 x 29 = Br. 1,044,000

Proposed plan: [36,000x29] – [500x25] = Br. 1,031,500

Average investment in receivables:

Current plan: 1,044,000/6.2 = Br. 168,387

Proposed Plan: 1,031,500 /9 = Br. 114,611

The marginal decrease in receivables investment:

Average investment in receivables under the current plan	Br. 168,387
Less: Average investment in receivables under the proposed plan	Br. 114,611
Saving in average investment	Br. 53,776

At the 20 percent return, the firm will be able to earn Br. 10,755.20 (53,776 x0.2= 10,755.20)

ii. Incremental costs

i) Decline in Sales volume
Loss of sales = Decline in sales volume x contribution per unit

= 500 x 7

=Br. 3,500

iii) Increase in collection cost

Proposed plan:	Br. 30,000
Current plan:	Br. 10,000
Increase in collection cost	Br. 20,000

iii. Compare incremental cost with incremental benefit

Incremental benefits: 23,200 + 10,755.20 = 33,955.20… (i)

Incremental costs: 3,500 + 20,000 = 23,500… (ii)

Incremental benefits are greater than incremental costs by Br. 10,455.20 (i-ii)

iv. Decision The firm will be benefited if the new proposal is implemented

Chapter Five

I. True or false

1. False 2. False 3. False 4. False 5. False

II. Multiple Choices

1. c 2 . b 3. d 4. b 5. d 6. a

III. Self Test Problems

a. $EOQ = \sqrt{\frac{2x90{,}000x300}{6}} = \underline{3000 \text{ units}}$

b) Determination of optimal order quantity

1. Order size (unit)	3,000	4,500	6,000
2. Average inventory (unit)	1,500	2,250	3,000
3. Annual requirement (unit)	90,000	90,000	90,000
4. Number of orders	30	20	15
5. Price per unit	3	2.94^	2.91*
6. Cost of purchase	270,000	264,600	261,900
7. Carrying cost [Br.6 per unit x (**2**)]	9,000	13,500	18,000
8. Total ordering cost	9,000	6,000	4,500
9. Total ordering cost (6+7+8)	288,000	284,100	284,400

^ 2.94 = 3-(3x.02) * 2.91= 3- (3x0.03) are prices after discount

The total cost is the least at the order size of 4,500 units. Hence, the firm should place order for 4,500 units.

2. a) $EOQ=\sqrt{\frac{2x60{,}000x30}{0.4}} = 3{,}000$ units

Carrying cost per unit is computed as:

Total carrying cost = 60,000 x 2 x 0.2 = Br. 24,000 Carrying cost per unit = 24,000/ 60,000 = Br. 0.4

b) Order point = (lead time x normal usage during lead time) + (safety stock)

= (2 months x 5,000) + 2,000

= 12,000 units

c) EOQ at cost per valve of Br.3.0

$\sqrt{\frac{2x60{,}000x30}{0.6}}$ = **2459 units**