

Cash Management

Meeting 4

- 1. Explain the **concept** of cash management.
- 2. Explain how to improve cash management **efficiency**.
- 3. Explain the benefits of cash management, speed up cash income and slow down cash expenditures.
- 4. Ability to calculate **optimal cash balance** (Baumol model, and Miller-Orr model).

Concept of cash

- Though cash hold the smallest portion of total **current assets**. However, cash is both the beginning and end of **working capital cycle** – cash, inventories, receivables and cash.
- It is the cash, which **keeps the business going**. Hence, every enterprises has to hold **necessary cash for its existence**.
- Moreover, steady and healthy circulation of cash throughout the entire business operations is the basis of **business solvency**.

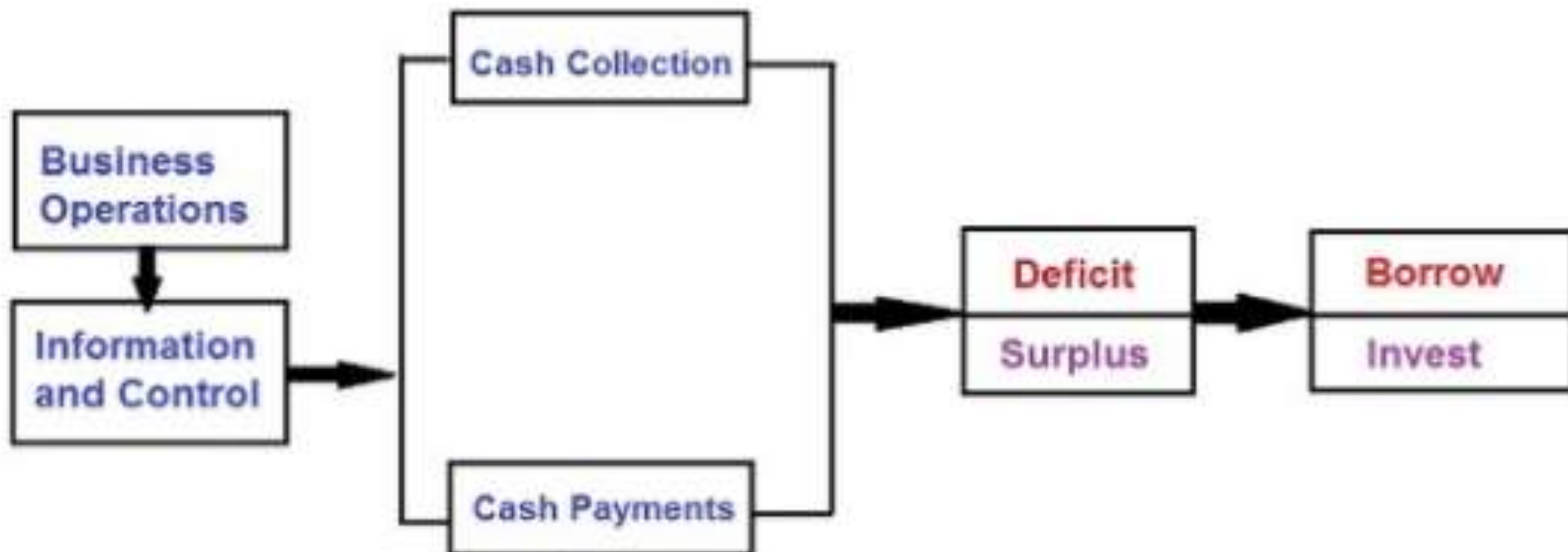
Concept of cash

- Cash may be interpreted under two concepts.
- **In narrow sense**, cash is very important business asset, but although coin and paper currency can be handled, the major part of the cash of most enterprises is in the form of bank checking accounts, which represent claims to money rather than tangible property.
- While **in broader sense**, cash consists of legal tender, cheques, bank drafts, money orders and demand deposits in banks.

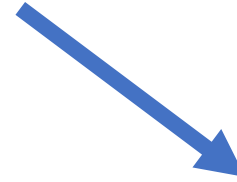
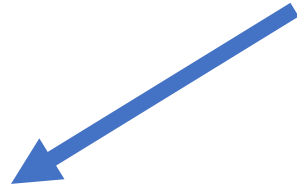
Cash Management

- Is a process of:
- collecting cash
- managing cash
- using cash for investing

Cash Management cycle



Cash



Deficit

Surplus



Borrow

Invest

Motivation for Holding Cash



Transaction Motive

- Companies need to be able to pay bills
- Companies need a cash reserve in order to balance short-term cash inflows and outflows since these are not perfectly matched
- Measure: quick ratio

Precautionary motive

- Companies need to avoid uncertainty in future
- Companies need a cash reserve in case there will be unexpected demands for cash in future
- Measure: volatility of operating cash flows

Speculative motive

- Companies need cash reserves for any investment opportunities
- Companies need to get profit making opportunities from fluctuations in commodity prices, security prices, interest rates, and foreign exchange rates.

Transaction Motive

- Firms need **cash to meet their transaction needs**.
- The **collection of cash** (from sale of goods and services) is not perfectly synchronised with the **payment of cash** (for purchase of goods and services).
- Hence, some cash balance is required as a **buffer**.

Precautionary Motive

- There **may be some uncertainty about the cash inflows** from sale of goods and services.
- Likewise, there may be uncertainty about cash outflows on account of purchases.
- To protect itself against such uncertainties, a **firm may require some cash balance**.

Speculative motive

- Companies may build up cash reserves in order to **take advantage of any attractive investment opportunities** that may arise.
- These opportunities may include fluctuations in commodity prices, security prices, interest rates, and foreign exchange rates.
- If a company has significant speculative cash reserves for which it cannot see an advantageous use, it may choose to enhance shareholder value by returning them to shareholders (dividends)

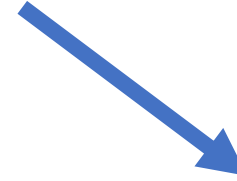
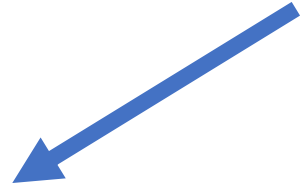
Investing surplus cash

- If a firm's need to hold cash is reduced, the funds can be invested in a number of different **short-term securities**
- Including Treasury bills, certificates of deposit, commercial paper, repurchase agreements, banker's acceptances, and short-term tax exempts

INVESTMENT OF SURPLUS FUNDS

- Companies often have **surplus funds for short periods** of time before they are required for capital expenditures, loan repayment, or some other purpose.
- Instead of allowing these surplus funds to accumulate in current account where they earn no interest, **companies invest them in a variety of short-term instruments** like term **deposits** with banks, money market mutual funds, and so on.
- Managing the investment of surplus funds is a very important **responsibility of the financial manager**. This has become more so in recent years, thanks to higher corporate liquidity and wider range of investment options.

Investment Portfolio: Three Segments



The ready cash segment

reserves for the company's cash account to meet **operational needs**

The controllable cash segment

outflows **like taxes, dividend, interest payments, and repayments of borrowings**

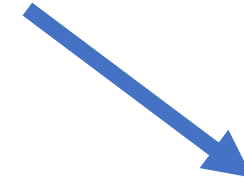
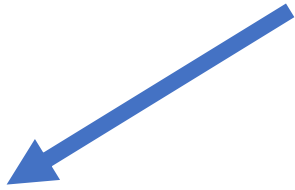
The free cash segment

surplus funds invested in **short-term instruments** to generate income

Investment Portfolio: Three Segments

- The ready cash segment represents a reserve for the company's cash account. It is meant to increase the cash resources of the company to meet unanticipated operational needs. Investments in this segment must necessarily be highly liquid in nature.
- The controllable cash segment represents that part of the investment portfolio which is meant to meet the needs of knowable outflows like taxes, dividend, interest payments, and repayments of borrowings. Ideally, investments in this segment must be matched in size and maturity to known future outflows.
- The free cash segment represents that part of the investment portfolio which is meant neither to increase unforeseen current cash needs nor to meet known future outflows. It essentially represents surplus funds with the firm which has been invested in short-term instruments to generate income, without much concern for liquidity or maturity.

Criteria for Evaluating Investment Instruments



Safety

Refers to the probability of getting back the amount invested

Liquidity

Refers to the ability of the investor to convert instrument into cash without loss

Yield

the return earned from instrument by way of interest or dividend

Maturity

refers to the life of the instrument

Criteria for Evaluating Investment Instruments

- Safety refers to the probability of getting back the amount invested. Treasury bills may be regarded as the safest of all the instruments as they represent the obligations of the government. The safety of the other instruments depends on the type of the instrument and the issuer. A high degree of safety is essential for an instrument to be considered for inclusion in the short-term investment portfolio of the firm.
- Liquidity refers to the ability of the investor to convert it into cash on short notice without incurring a loss. An instrument may be quite safe if it is held till maturity, but it may not be possible to sell it prematurely without suffering a loss. For a traded instrument, a large and active secondary market ensures liquidity. For a non-traded instrument, liquidity is high if the penalty for premature liquidation is negligible.
- Yield is the return earned from it by way of interest, dividend, and capital appreciation. Some instruments like Treasury bills and commercial paper do not pay interest, but they are sold at a discount and redeemed at face value. Yield has to be measured in post-tax terms, taking into account the tax rate applicable to the returns earned by the investment instrument.
- Maturity refers to the life of the instrument. While some instruments (like Treasury bills) have fixed original maturities, others (like certificates of deposit) can have tailormade maturity. Generally, the longer the maturity, the greater the yield.

Investment Options

- **Fixed Deposits** with Banks
- Mutual Fund Schemes
- **Treasury Bills**
- **G-Secs**
- Commercial Paper
- Certificates of Deposits
- Inter-Corporate Deposits
- Ready Forwards

Investment
instruments

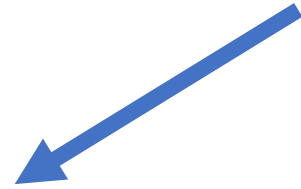
T-bills (short term)

G-secs (long term) - risk ↓ return ↓

Deposits - risk average return average

Futures/options (derivatives) - risk ↑ return ↑

Efficient Cash Management Strategies



Delaying and stretching Accounts Payables

by paying accounts payable as late as possible and cash discounts

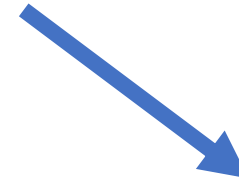
Plus (better bigger)



Speeding up collection of Accounts Receivables

by changes in credit terms and cash discounts

Minus (better smaller)



Efficient Inventory- Production Management

by increasing the raw materials and finished turnover, and decreasing the production cycle (better planning)

Minus (better smaller)

Delaying and stretching Accounts Payables

- The firm should **pay its accounts payable as late as possible** without damaging its credit standing.
- But the firm should take advantage of **cash discount**, if any, offered by suppliers for prompt payment.
- The reason is that, the cost of not taking a discount will work out more than the cost of delaying payment.

Speeding up collection of Accounts Receivables

- By speeding up the collection of accounts receivables, the cash cycle would come down, thereby resulting in saving a cost to the firm.
- But it should be done very carefully so that the customers are not lost.
- The average collection period of receivables can **be reduced by changes in credit terms**, credit standards and collection policies.
- Cash discounts should be given for **immediate payments** or payments within 10 days of invoice to encourage customers to speed up the payments.

Efficient Inventory-Production Management

- **Increasing the raw materials turnover** by using more efficient inventory control techniques.
- **Decreasing the production cycle** through **better production planning, scheduling and control techniques**, which will lead to an increase in the work-in-progress inventory turnover.
- **Increasing the finished goods turnover** through **better forecasting of demand** and a better planning of production.

Efficient Cash Management

- **Cash conversion cycle CCC** = Average age of Inventory + Average collection period - Average Accounts Payable period
- **Cash turnover** = Number of times cash is used during the year = $365/\text{Cash cycle}$
- **Minimum operating cash** = It is the level of opening **cash balance** at which a firm would **meet all obligations** and is computed by dividing total annual outlays by the cash turnover
- **Or total operating cashflow divided by cash turnover**

Example:

- Let us assume that a firm currently takes 40 days to pay its suppliers, allows 75 days to collect receivables and a gap of 90 days between purchase of raw materials and the sale of finished goods. Total operating annual outlay = \$250 000.
- So, current cash cycle =
- $90 \text{ days} + 75 \text{ days} - 40 \text{ days} = 125 \text{ days}$
- So, cash turnover =
- $365/125 = 2.92$ or 3 days
- So, minimum operating cash =
- $\$250,000/2.92 \text{ days} = \$85,616.44$

Example:

- Now what if:
 - Accounts payable increases by 15 days
 - Average age of inventory reduces by 20 days
 - Speeds up collection by 25 days.
- New cash cycle, new cash turnover, new minimum operating cash?

New cash cycle, new cash turnover, new minimum operating cash:

- The new cash cycle would be $\Rightarrow (90-20) + (75-25) - (40+15)$
- $\Rightarrow 70 + 50 - 55 \Rightarrow 65$ days
- So, the new cash turnover would be $= 365/65 = 5.6$ days
- So, the new minimum operating cash requirement $= \$250,000/5.6$ days $= \$44,642.86$ or $\$44,643$

Efficient cash management: result

- Difference in minimum operating cash requirement =>
- \$85,616 (old) - \$44,643 (new) = \$40,973 – we could this amount of cash
- This is the result of efficient cash management

Cash balance

- **Surplus cash** – large cash balance – buying securities (investing) – few transactions - but higher opportunity costs of maintaining cash
- **Optimal cash** – can invest excess cash for return and have enough cash for future
- **Lack of cash** – small cash balance – selling securities – many transactions

Optimal cash balance by Baumol and Miller-Orr models

- The main objective of cash management is **an optimal cash balance**
- Optimal balance means a position when the **cash balance** amount is on the most **invest the excess cash for a return and at the same time have sufficient liquidity for future needs**
- The question is how to determine the optimal cash balance?
- **By Baumol and Miller-Orr offer cash models**

The Baumol model is based on the following assumptions:

- The firm is able to **forecast cash requirements**
- The firm's **payouts** are constant
- The **opportunity cost** of holding is constant
- **Transaction costs** for all conversions of securities into cash are constant
- **A company sells securities and realises cash, and this cash is used to make payments.**
- As the cash balance decreases and reaches a point, the financial manager tops up its cash balance by selling marketable securities available with it and this pattern continues.

The Baumol model

- Financial Manager decisions:
- If cash balance ↓ - selling securities - making payments -
- cash balance ↓ again ... =//=

Limitations of the Baumol Model

- The model **assumes constant rate of use of cash** which is a hypothetical assumption and is not possible in practice by a firm.
- The model assumes fixed nature of cash withdrawal which is **Cash payments are not often predictable** also not realistic.
- **Transaction cost is also difficult to measure** in advance since it depends on the type of investment as well as the maturity period.
- This model is concerned only with **transaction balances** and **not with precautionary balances**.

Baumol Model

- The model can determine the optimum amount of cash for a company to hold **under conditions of certainty**. The objective is to minimize the sum of the fixed costs of transactions and the opportunity cost of holding cash balances that do not yield a return.

- The optimal level of cash is determined using the following formula:

- Optimal level of cash = $OCL = \sqrt{(2F T / I)}$

F = Fixed costs of a transaction

T = Total cash required for the specified time period

I = Interest rate on marketable securities

Baumol Example:

- A Company estimates a cash requirement of \$2,000,000 for a 1 month period. The opportunity interest rate is 6% per annum, which works out to 0.5 percent per month. The transaction cost for borrowing or withdrawing funds is \$150.
- Optimal level of cash = $\sqrt{(2 \times \$150 \times \$2,000,000) / 0.005} \Rightarrow \$346,410.16$
- With the above optimal transaction size, we can now find the number of transactions required.
- Number of transactions required = $\$2,000,000 / \$346,410.16 \Rightarrow 5.77$ or 6 transactions during the month.

Baumol Question 1:

- Find out the optimum cash balance using Baumol's Model?
- Annual cash needed \$4.800.000
- Transaction cost \$90 per conversion
- Interest rate 9%

Baumol Answer 1:

- As per Baumol's Model
- C = Cash required each time to restore balance to minimum cash
- F = Total cash required during the year = \$4.800.000
- T = Cost of each transaction between cash and marketable securities = \$90
- I = Rate of interest on marketable securities = 9%
- $OCL = \sqrt{(2FT/I)} = \$ 97.979.59$

Miller-Orr model

- When the **cash payments are uncertain**, Miller-Orr model can be used
- This model places **upper and lower limits on cash balances**
- When the upper limit is reached, a transfer of cash to marketable securities is made; when the lower limit is reached, a transfer from securities to cash is made.
- As long as the cash balance stays within the limits, no transaction occurs.

Miller-Orr model

- Upper limit of cash balance is reached - a transfer of cash to marketable securities is made (buying securities)
- Lower limit is reached - a transfer from securities to cash is made (selling securities)

Miller-Orr model

- The various factors in this model are fixed costs of a securities transaction (F) which is assumed to be the same for buying and selling, the daily interest rate on marketable securities (I) and variance of the daily net cash flows, represented by σ^2 .

Miller-Orr model

- This model assumes that the **cash flows are random**.
- According to this model, the optimal cash balance z is computed as follows:
- $Z = \sqrt[3]{(3FV)/4I}$
- The various factors in this model are fixed costs of a securities transaction (F), the daily interest rate on marketable securities (I) and variance of the daily net cash flows, represented by V .

Miller-Orr Example:

- Fixed cost of a securities transaction = \$5
- Variance of daily net cash flows = \$25
- Daily interest rate on securities = 0.0003 (10% per annum, so 10%/360 days = 0.0003 daily)
- Optimal cash balance OCB = ?
- $3\sqrt{(3 \times \$5 \times \$25) / (4 \times 0.0003)} \Rightarrow \67.86
- (or) \$68 rounded off