


NPTEL ONLINE CERTIFICATION COURSES

MANAGEMENT OF COMMERCIAL BANKING

PROF. JITENDRA MAHAKUD
DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES, IIT KHARAGPUR

Module 05: Managing Investment Portfolios and Liquidity of Commercial Banks

Lecture 46: Managing Liquidity of Commercial Banks-I

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CONCEPTS COVERED

- Concept of liquidity
- Demand for and supply of liquidity funds
- Sources of liquidity problem

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What is liquidity?

- The availability of cash at the time needed at a reasonable cost
- A firm is said to be liquid if it has ready access to immediately spendable funds at reasonable cost at time those funds are needed
  - Right amount of immediately spendable funds on hand
  - Can raise liquid funds in timely fashion by borrowing or selling assets
- The size and volatility of cash requirements affect the liquidity position of the bank
  - Transaction that affect the bank's cash balance and liquidity position: Deposits and withdrawals; loan disbursements and loan payments
- Lack of adequate liquidity is the first sign of the trouble for banks

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Supplies of Liquid Funds

- Incoming Customer Deposits
- Revenues from the Sale of Non-deposit Services
- Customer Loan Repayments
- Sales of Bank Assets
- Borrowings from the Money Market

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Demands for Liquidity

- Customer Deposit Withdrawals
- Credit Requests from Quality Loan Customers
- Repayment of Non-deposit Borrowings
- Operating Expenses and Taxes
- Payment of Stockholder Dividends

Net Liquidity Position= Supply of liquid funds- demand for liquid funds

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Essence of Liquidity Management

- Rarely are the demands for liquidity equal to the supply of liquidity at any particular moment. The financial firm must continually deal with either a liquidity deficit or surplus
- There is a trade-off between liquidity and profitability. The more resources tied up in readiness to meet demands for liquidity, the lower is the financial firm's expected profitability.

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Sources of Liquidity Problems

- Imbalances between maturity dates of their assets and liabilities
- High proportion of liabilities (especially demand deposits and money market borrowings) subject to immediate repayment
- Sensitivity to changes in interest rates
  - May affect customer demand for deposits
  - May affect customer demand for loans
- Central role in the payment process, reputation and public confidence in the system

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CONCLUSION

- A firm is said to be liquid if it has ready access to immediately spendable funds at reasonable cost at time those funds are needed
- The net liquidity position is the difference between supply of liquid funds and demand for liquid funds
- The sources of liquidity problem are mismatch between liability and assets, interest rate fluctuations and other exogenous factors

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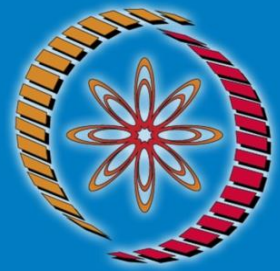
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Module 05: Managing Investment Portfolios and Liquidity of Commercial Banks
Lecture 47: Managing Liquidity of Commercial Banks-II

CONCEPTS COVERED

- Steps in liquidity management
- Estimation of liquid funds needed: Sources and uses of funds approach, Liquidity indicator approach

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Liquidity Management Steps

- Estimation of funds needed
  - Deposits inflows and outflows
  - Varying levels of loan commitments
- Meeting liquidity needs
  - Asset management
  - Liability management

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Methods for Estimating Liquidity Needs

- Sources and Uses of Funds Approach
- Liquidity Indicator Approach
- Structure of Funds Approach
- Signals from the Marketplace

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Sources and Uses of Funds Approach

- Liquidity rises as deposits increase and loans decrease
- Liquidity declines when deposits decrease and loans increase
- Mismatch between sources and uses of liquidity: Liquidity gap
- Liquidity gap can be positive or negative

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Sources and Uses of Funds Approach …

- Develop a sources and uses of funds statement
- Loan portfolio has to be divided into different components
- Loans and deposits must be forecasted for a given liquidity planning period
- The estimated change in loans and deposits must be calculated for the same planning period
- The liquidity manager must estimate the bank's net liquid funds by comparing the estimated change in loans to the estimated change in deposits
- Influence of government and economic factors on loan and deposits

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Sources and Uses of Funds Approach …

Estimated change in total loans for the coming period is a function of [(projected growth in the economy (for example, the growth of gross domestic product [GDP] or business sales)), (projected quarterly corporate earnings), (current rate of growth in the money supply), (projected prime loan rate minus the commercial paper rate), and (estimated rate of inflation)]

Estimated change in total deposits for the coming period is a function of [(projected growth in personal income in the economy), (estimated increase in retail sales), (current rate of growth of the money supply), (projected yield on money market deposits), and (estimated rate of inflation)]

Estimated liquidity deficit (−) or surplus (+) for the coming period = Estimated change in deposits − Estimated change in loans

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Sources and Uses of Funds Approach …

- Forecasting the sources and uses of funds
  - Trend component: Trend line using as reference points year end, quarterly and monthly deposits and loans established over the last 10 years
  - Seasonal component: How deposits and loans are expected to behave in any given week or month due to seasonal factors as compared to the most recent year end deposit or loan level
  - Cyclical component: Positive or negative deviations from bank's expected deposits and loans depending upon the strength and weakness of the economy in the current year

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Example

Deposit forecast	Trend estimate	Seasonal element	Cyclical element	Total estimated deposit
March week 1	1220	-12	-8	1200
March week 2	1202	-50	-52	1100
March week 3	1204	-108	-96	1000
March week 4	1206	-138	-118	950
April week 1	1208	72	-30	1250
April week 2	1210	22	-32	1200
Loan Forecast	Trend estimate	Seasonal element	Cyclical element	Total estimated deposit
March week 1	798	7	-5	800
March week 2	810	49	-9	850
March week 3	801	174	-25	950
March week 4	805	163	32	1000
April week 1	806	27	-83	750
April week 2	810	95	-5	900

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Example …

End of month	Estimated total deposit (Rs)	Estimated total loan (Rs)	Estimated Change in deposits (Rs)	Estimated Change in Loans (Rs)	Estimated Liquidity Deficit or surplus
March week 1	1200	800	-	-	-
March week 2	1100	850	-100	50	-150
March week 3	1000	950	-100	100	-200
March week 4	950	1000	-50	50	-100
April week 1	1250	750	300	-250	550
April week 2	1200	900	-50	150	-200

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Basle Committee Framework (for Large banks)

- **Measuring and managing net funding requirements**
  - Construction of detailed sources and uses of fund statement referred to as maturity ladder.
  - Maturity ladder gives a daily calculation of the cumulative net excess or deficit of funds selected dates in future
  - Variety of maturity ladder constructed considering alternative scenarios: normal business conditions, institution specific problems and general market problem
- **Managing market access**
- **Contingency planning**

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Liquidity Indicator Approach

- **Cash position indicator:** Cash and deposits due / Total assets
- **Liquid securities indicator:** Government securities / Total assets
- **Net federal funds and repurchase agreements position:** (Govt. funds sold and reverse repo agreements – Govt. fund purchased and repurchase agreement) / Total assets
- **Capacity ratio:** Net loans and leases / Total assets (negative indicator)
- **Pledged securities ratio:** Pledged securities / Total security holdings (negative)
- **Hot money ratio:** Money market assets / volatile liabilities
- **Deposit brokerage index:** Brokered deposits / total deposits
- **Core deposit ratio:** Core deposits / Total assets
- **Deposit composition ratio:** Demand deposits / Time deposits
- **Loan commitments ratio:** Unused loan commitments / Total assets

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CONCLUSION

- Liquidity management involves two steps i.e. estimating liquidity needs and meeting liquidity needs
- There are four approaches used for estimating liquidity needs (i) sources and uses of funds approach, (ii) Liquidity indicator approach, (iii) structure of funds approach and (iv) signals from market place approach

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Lecture 48: Managing Liquidity of Commercial Banks-III

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CONCEPTS COVERED

- Structure of funds approach
- Signals from market place

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Structure of Funds Approach

- Banks deposits and other funds sources are divided into different categories based on their estimated probability of being withdrawn
- Three categories of deposits and non-deposit liabilities
  - Hot money liabilities
  - Vulnerable funds
  - Stable funds

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Structure of Funds Approach…

- Hot money liabilities
  - Deposits and other liabilities that are very interest sensitive
  - Sure about withdrawn during the current period
- Vulnerable funds
  - Some percentage (25% to 30%) of total deposits may be withdrawn during the current period
- Stable funds (core deposits / core liabilities)
  - Unlikely to be removed during the current period

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Structure of Funds Approach…

- Manager must aside liquid funds according to some desired operating rule for each of these funds sources
- Liability liquidity reserve= 0.95 (Hot money deposits and non deposit funds- Legal reserves hold) + 0.30 (Vulnerable deposit and non deposit funds – Legal reserves held) + 0.15 (Stable deposits and non deposit funds – Legal reserves held)
- Management should strive to meet all good loans that walk in the door in order to build lasting customer relationships

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Structure of Funds Approach…

- Total liquidity requirement = Deposits and non deposit liability liquidity requirement and loan liquidity requirement= = 0.95 (Hot money deposits and non deposit funds- Legal reserves hold) + 0.30 (Vulnerable deposit and non deposit funds – Legal reserves held) + 0.15 (Stable deposits and non deposit funds – Legal reserves held) + 1.00 (Potential loans outstanding – Actual loans outstanding)
- These are subjective estimates and depends upon the management's decisions

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Example

Hot Money: Rs. 25 million, Vulnerable fund: Rs. 24 Million, Stable fund: Rs. 100 million, Legal resrve requirements: 3%, Total Loan: Rs. 135 million, Recent loan: Rs. 140 million, Growth rate of loan: 10%

Liquidity requirement: 0.95 (25-0.03*25) + 0.3 (24-0.03*24) + 0.15 (100-0.03*100) + 140*0.1+ (140-135)=Rs. 63.57 million

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Structure of Funds Approach…

- Use of probabilities in deciding how much liquidity to hold
- Defining worst and best possible liquidity positions
- Worst possible liquidity position: High loan demand (beyond management's expectation) and deposits are not adequate to fulfill the demand (liquid deficit)
- Best possible liquidity position: Deposit growth above the expectation and loan demand below the expectation (liquid surplus)

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Structure of Funds Approach…

- Expected liquidity requirement = Probability of outcome X (Estimated liquidity surplus or deficit in outcome X) + Probability of outcome Y (Estimated liquidity surplus or deficit in outcome Y) + --- +---
- The sum assigned probabilities assigned by the management should be equal to 1.

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Example

Possible Liquidity Outcomes for next period	Estimated Average Volume of Deposits Next Period	Estimated Average Volume of Loans Next Period	Estimated Liquidity Surplus or Deficit Position next period	Probability Assigned by Management to Each possible outcome
Best possible liquidity position	170	110	+60	15%
Liquidity position bearing the highest probability	150	140	+10	60%
Worst possible liquidity position	130	150	-20	25%

Expected liquidity requirement= 0.15(60 million) + 0.6 (10 million)+0.25 (-20 million)= Rs. 10miilion

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Signals from Marketplace

- Public confidence
- Stock Price behavior
- Risk Premiums on CDs and other borrowings
- Loss sales of assets
- Meeting commitments to credit customers
- Borrowings from central bank

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CONCLUSION

- Deposits and non-deposit liabilities are categorized into three categories; hot money liabilities, vulnerable funds and stable funds
- Certain market indicators like Public confidence, Stock Price behavior, Risk Premiums on CDs and other borrowings also signals about the liquidity position of the banks

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Module 05: Managing Investment Portfolios and Liquidity of Commercial Banks
Lecture 49: Managing Liquidity of Commercial Banks-IV

CONCEPTS COVERED

- Legal Reserves and Money Position
- Regulations on Calculating Legal Reserve Requirements
- Factors in Choosing Among Different Sources of Reserve

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Money Position Management

- Management of a financial institution's liquidity position can be harrowing
- It requires taking quick decision that may have long run consequences for profitability
- Most large depository institutions have designated an officer of the firm as *money position manager*
- Smaller banks and thrifts often hand over this job to larger depositories

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Legal Reserves

- Money position managers responsible for ensuring that the institution maintains an adequate level of legal reserves
- Legal Reserves: Assets that a central bank requires depository institutions to hold as a reserve behind their deposits or other liabilities
- Only 2 kinds of assets can be used for this purpose: 1) cash in the vault; 2) deposits held in a reserve account with the regional fed

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Regulations on Calculating Legal Reserve Requirements

How much money must be held in legal reserves?

- Depends upon the volume and mix of each institution's deposits and also on the particular time period
- Amount of deposits subject to legal reserve requirements changes each year

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Regulations on Calculating Legal Reserve Requirements

Calculating Required Reserves

- Largest depository institutions must hold the largest percentage of legal reserves
- Total required legal reserves of each depository institution are figured by the same method

Total required legal reserves = Reserve requirement on transaction deposits × Daily average amount of net transaction deposits over the computation period + Reserve requirement on nontransaction reservable liabilities × Daily average amount of nontransaction reservable liabilities over the computation period.[3]

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Regulations on Calculating Legal Reserve Requirements

Calculating Required Reserves

- Once the reserve requirement is determined, the depository institution compares this calculated amount to the actual daily average holding of legal reserve assets: vault cash and reserve deposits with central bank
  - If legal reserves held > required reserves, depository institution has excess reserves; management invests the excess
  - If legal reserves held < calculated required reserve, depository institution had reserve deficit
  - institution to cover this deficit by acquiring additional legal reserves

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Sample Calculation of Legal Reserve Requirements

- **Applicable percentage Reserve Requirements imposed by Federal Reserve Board:**
  - **Banks with deposit of $16.3 million or less have no reserve requirements**
  - **Banks with deposit within $16.3 million upto $124.2 million carries 3% reserve requirement**
  - **Banks with deposit greater than $124.2 million carries 10 % reserve requirements**
  - **Non transaction reservable liabilities are subject to 0% reserve requirements**
- **let net transaction deposits deposit average 200 million over 14 days reserve computation period**
- **Non transaction reservable liabilities had a daily average of $300 million over the same period**

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Sample Calculation of Legal Reserve Requirements

- Daily average required legal reserve level

=0.00*$16.3 mil + 0.03* $(124.2-16.3)+ 0.1*(200-124.2)
=3.237million +7.58 million
=10.817 million

- Suppose a daily average of $5 million of vault cash is held over the required 2 week computation period
- The daily average level of required legal reserves to hold on deposit at the Fed:

- Total required legal reserves - Daily average vault =$10.817 million- $5 million= $5.817 million

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Factors Influencing the Money Position

Controllable Factors Increasing Legal Reserves	Controllable Factors Decreasing Legal Reserves
• Selling securities • Receiving interest payments on securities • Borrowing reserves from the Federal Reserve Bank • Purchasing Federal funds from other banks • Selling securities under a repurchase agreement (RP) • Selling new CDs, Eurocurrency deposits, or other deposits to customers	• Purchasing securities • Making interest payments to investors holding the bank's securities • Repaying a loan from the Federal Reserve bank • Selling Federal funds to other institutions in need of reserves • Security purchase under repurchase agreement (RP) • Receiving currency and coin shipments from the Federal Reserve bank

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Factors Influencing the Money Position

Noncontrollable Factors Increasing Legal Reserves	Noncontrollable Factors Decreasing Legal Reserves
• Surplus position at the local clearinghouse due to receiving more deposited cheques in its favour than the cheques drawn against it • Credit from cash letters sent to the Fed, listing drafts received by the bank • Deposits made by the U.S. treasury into a tax and loan account held at the bank • Credit received from the Federal Reserve bank for cheques previously sent for collection (deferred availability items)	• Deficit position at the local clearinghouse due to more cheques drawn against the bank than in its favour • Calls of funds from the bank's tax and loan account by the U.S. Treasury • Debits received from the Federal Reserve bank for cheques drawn against the bank's reserve account • Withdrawal of large deposit accounts, often immediately by wire

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Factors in Choosing Among Different Sources of Reserve

- **Immediacy of need:**
  - If a reserve deposit comes due within minutes or hours, the money position manager will normally tap the Federal funds market for an overnight loan or contact the Central Bank for a loan from its discount window
  - A depository institution can meet its nonimmediate reserve needs by selling deposits or assets, which may require more time to arrange
- **Duration of need**
  - If liquidity deficit is expected to last for only few hours, Federal funds market or the central bank's discount window is normally preferred
  - Liquidity shortages lasting days, weeks, or months are often covered with sale of assets or longer term borrowing

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Factors in Choosing Among Different Sources of Reserve

- Access to the market of liquid assets
  - Not all depository institution have access to all funds markets
  - Liquidity managers must restrict their range of choices to those their institution can access
- Relative costs and risks of alternative sources of funds
  - The cost of each source of reserves changes daily
  - Availability of surplus liquidity is also highly uncertain
  - Liquidity manager needs to draw on the cheapest source of reliable funds

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Factors in Choosing Among Different Sources of Reserve

- The interest rate outlook
  - When planning to deal with a future liquidity deficit, the liquidity manager wants to draw upon those funds sources whose interest rates are expected to be the lowest
- Outlook for Central Bank monetary policy
  - changes in central banks monetary policy shapes the direction and intensity of credit conditions in the money market
- Rules and Regulations applicable to a liquidity source
  - Most sources of liquidity cannot be used indiscriminately; user must conform to the rules
- Liquidity managers must carefully weigh each of these factors in order to make a rational choice among alternative sources of reserves

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CONCLUSION

The banks should maintain an adequate level of legal reserves

Amount of legal reserves depends upon the deposit mix of the banks

Major factors which affect the sources of reserve are immediacy of need, duration of need, access to the market, interest rate etc.

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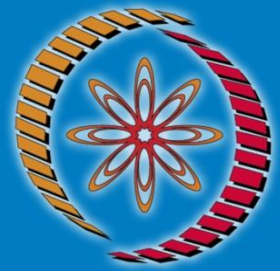
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Module 05: Managing Investment Portfolios and Liquidity of Commercial Banks
Lecture 50: Managing Liquidity of Commercial Banks-V

CONCEPTS COVERED

- Liquidity Management Strategies
- Optimum Bank Liquidity

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Liquidity Management Strategies

- **Asset Liquidity Management or Asset Conversion Strategy**
- **Borrowed Liquidity or Liability Management Strategy**
- **Balanced Liquidity Strategy**

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Asset Liquidity Management Strategies

- This strategy calls for storing liquidity in the form of liquid assets (t-bills, fed funds loans, cds, etc.) And selling them when liquidity is needed
- Liquid Asset
  - Must have a ready market so it can be converted to cash quickly
  - Must have a reasonably stable price
  - Must be reversible so an investor can recover original investment with little risk

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Options for Storing Liquidity

- Treasury Bills
- Fed Funds Sold to Other Banks
- Purchasing Securities for Resale (Repos)
- Deposits with Correspondent Banks
- Money market instruments
- Municipal Bonds and Notes
- Federal Agency Securities
- Negotiable Certificates of Deposits
- Eurocurrency Loans

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Cost of Asset Liquidity Management

- Loss of future earnings on assets that must be sold
- Transaction costs (commissions) on assets that must be sold
- Potential capital losses if interest rates are rising
- May weaken appearance of balance sheet
- Liquid assets generally have low returns

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Liability Liquidity Management Strategy

- This strategy calls for the bank to purchase or borrow from the money market to cover all of its liquidity needs
- Sources of Borrowed Funds
  - Call money market
  - Government Funds Purchased
  - Selling Securities for Repurchase (Repos)
  - Issuing Large CDs
  - Issuing Eurocurrency Deposits
  - Securing Advance from other FIs
  - Borrowing Reserves from the Discount Window of the central bank

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Liability Liquidity Management Strategy

Advantages

- Borrow Only When There is a Need for Funds
- Volume and Composition of the Investment Portfolio Can Remain Unchanged
- The Institution Can Control Interest Rates in Order to Borrow Funds (raise offer rates when needs requisite amounts of funds)

Disadvantages

- Highest Expected Return But Carries the Highest Risk Due to Volatility of Interest Rates and Possible Rapid Changes in Credit Availability
- Borrowing Cost is Always Uncertain-> Uncertain Earnings
- Borrowing Needs Can Be Interpreted as a Signal of Financial Difficulties

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Balanced Liquidity Management Strategy

- Combination of asset and liability management strategies
- Some of the expected demands for liquidity are stored in assets and other anticipated liquidity needs are managed by arrangements for lines of credit from potential suppliers of funds
- Unexpected cash needs are met from near term borrowings
- Longer term liquidity needs can be planned for can be arranged from asset management

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Guidelines for Liquidity Managers

- They should keep track of all fund-using and fund-raising departments exists in the bank
- They should have the knowledge about advance withdrawals by the biggest credit or deposit customers
- The priorities and objectives for liquidity management should be clear
- Liquidity needs must be evaluated on a continuous basis

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Funds Management of Liquidity

- **Liquidity Ratios**
  - **Loans / deposits**
  - **Loans / non-deposit liabilities**
  - **Near cash assets / large denomination liabilities**
- **Liquid assets and liabilities in period T / Estimated Liquid needs in period T**
  - **Negative ratio means that bank has sufficient liquidity**

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Optimum Bank Liquidity

- Balancing risks and returns
- Measures of liquidity need to be high enough to meet even unexpected changes in liquidity needs and sources
- Opportunity cost of liquidity should be considered
- Cost of insufficient liquidity and cost of maintaining liquidity should be analyzed

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CONCLUSION

- The liquidity management strategies can be categorized as asset management strategy, liability management strategy and balanced strategy
- The optimum liquidity of the bank can be determined by the cost and benefits occurred in different strategies

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