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MANAGEMENT OF COMMERCIAL BANKING

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

Module 06: Management of Liabilities, Capital and Off-Balance Sheet Activities of Commercial Banks

Lecture 56: Management of Off-Balance Sheet Activities-III

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CONCEPTS COVERED

- Loan Sales
- Trade Finance
- Foreign Exchange
- Services for Fee
- Investment Banking
- Selling Investment Product

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Other Off Balance Sheet Activities: Loan Sales

- Banks can sell loans to a third party as a source of funds
- Normally purchased by large banks and non-financial institutions
- Loan sales can be made with or without recourse
- Sales with recourse: even though the loan sold by assignment (i.e. buyer holds the loan), the selling bank retains some credit risk (in whole or in part) for loan losses
- Benefits of loan sales:
  i. Enables bank to increase diversification
  ii. Lower capital requirements
  iii. Eliminate low earning assets from their portfolio
  iv. Reduces credit risk

Other Off Balance Sheet Activities: Loan Sales

- Demerit: Banks could sell off high-quality, highly marketable loans and eventually end up with lower quality loans on balance sheet
- Implications of loan sales:
  1. Make loans without relying on deposits as a source of funds
  2. Convert traditional lending into quasi-securities business
  3. By purchasing loan sales, other non banking financial institutions are becoming more like banks

Other Off Balance Sheet Activities: Trade Finance

Acceptance Participation

- A bankers acceptance is created when the bank accepts a time draft (a bill of exchange) and agrees to pay it at face value on maturity
- Draft covers sale of goods with respect to international trade
- Banker's acceptance is booked as an asset
- Some banks sell participation (acceptance participation) for all or part of the time draft:
  - ✓ Reduces dollar amount shown in books
  - ✓ Accepting bank still obligated to pay face amount of acceptance at maturity
- Banks that buy acceptance participation have contingent liabilities that do not appear on their balance sheet

Other Off Balance Sheet Activities: Foreign Exchange, Services for Fee

- Large banks operate foreign exchange trading desk for the purpose of brokerage and dealing, speculating, and providing forward contracts in currencies
- Fairly riskless source of bank income is advisory and management fees
- Do not involve commitments and contingencies on assets listed
- These include:
  i. Fiduciary services including trust funds and portfolio management
  ii. Cash management
  iii. Networking

Other Off Balance Sheet Activities: Services for Fee

Cash management

- Used to help business concerns collect remittances and use their bank balances effectively
- Lock boxes are important part of cash management system
- Post office boxes where customer's remittances are sent via mail and then collected by bankers who deposit them in a business concern's account
- Banks receive fees for collection and processing funds

Other Off Balance Sheet Activities: Services for Fee

Networking/ Strategic Alliance

- Refers to linkages among different companies to exploit comparative advantage in the production and delivery of product
- Symbiotic relationship seeks to increase customer convenience for both retail and bank
- Also use network to sell insurance, data processing, and other services

Other Off Balance Sheet Activities: Investment Banking

- Provide advice to businesses, governments, and other institutions interested in expansion to new markets , pursuing mergers and acquisitions and offer new debt and equity securities in the financial marketplace
- When economy is booming, investment banking can be among the most profitable financial services

Leading investment banks in the world today:

- ✓ Citigroup
- ✓ JP Morgan Chase
- ✓ Morgan Stanley
- ✓ Goldman Sachs
- ✓ Credit Suisse
- ✓ UBS
- ✓ Nomura Securities
- ✓ Deutsche Bank
- ✓ Raymond James

Other Off Balance Sheet Activities: Investment Banking

Key Investment Banking Services

- Traditionally, the best-known and often the most profitable investment banking service is security underwriting
  - Purchase for resale of new stocks, bonds, and other financial instruments in the money and capital markets on behalf of clients who need to raise new money
  - One of the most profitable underwriting services – initial public offerings (IPOs)
- Leveraged buyouts (LBOs): involve acquisition of a company, usually by a small group of investors, and typically are funded by large amounts of debt
- Recently, many investment banks jumped into the hedge fund business

Other Off Balance Sheet Activities: Investment Banking

Examples of client questions that investment bankers can assist in answering:

- ✓ **Should the clients attempt to raise new capital? If so, how much, where, and how do we go about this fund-raising task?**
- ✓ **Should client's company enter new market areas at home or abroad? If so, how can we best accomplish this market-expansion strategy?**
- ✓ **Does client's company need to acquire or merge with other firms? Which firms and how? And when is the best time to do so?**
- ✓ **Should we sell our company to another firm? If so, what is our company worth? And how do we find the right buyer?**

Other Off Balance Sheet Activities: Selling Investment Products

- Investment products like stocks, bonds, mutual funds, annuities and similar financial instruments seem to offer better returns than many conventional deposits
- Depositors also invested money in other alternate investment options like real estate in an effort to keep up with inflation
- In response banks developed investment and insurance products and offered financial planning services in an attempt to win back customers
- Most common investment product sold by depository institutions are Mutual Funds

Other Off Balance Sheet Activities: Selling Investment Products

Mutual Funds

- Have been attractive to many individuals and institutional investors because long run yields appear to be relatively high and most funds are diversified, spreading the risk exposure
- Popular mutual funds include: Exchange traded funds (ETFs) and Hedge Funds
- Exchange traded funds: behave like index tracking mutual funds and trade all day in stock exchanges
- Hedge funds: private investment partnership whose shares are offered primarily to wealthy individuals and major institutions
  - ✓ Often make high stakes bets on the direction the market will take
  - ✓ Supplying for venture capitals

Other Off Balance Sheet Activities: Selling Investment Products

Annuity Investment Products

- Annuities are a hedge against living too long and outlasting one's savings
- Fixed annuities promise a customer who contributes a lump sum of savings a fixed rate of return over the life of the annuity contract
- Variable annuities allow investors to invest a lump sum of money in a basket of stocks, mutual funds, or other investments under a tax-deferred agreement, but there may be no promise of a guaranteed rate of return

Other Off Balance Sheet Activities: Selling Investment Products

Annuity Investment Products

- Recently a new type of annuity contract has appeared, the equity-index annuity
- Combines the features of both fixed and variable annuities
- One advantage for financial firms selling this service is that annuities often carry substantial annual fees
- One significant disadvantage with annuities sold through depository institutions is they typically compete with selling deposits

Bancassurance

- It is a collaboration between a bank and insurance company wherein the bank undertakes corporate agency to sell insurance products to its customers for the fees
- It is developed with the assumption that banks have direct access to their customers
- Models of bancassurance
  - Referral model
  - Corporate agency
  - Joint venture
- Classification of products
  - Standalone insurance product
  - Blend of insurance with bank products

CONCLUSION

Other off-balance sheet items are loan sales, acceptance participation, investment banking services, mutual fund and insurance services etc.

All these activities help the banks to diversify the risk and increase the income

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Module 06: Management of Liabilities, Capital and Off-Balance Sheet Activities of Commercial Banks

Lecture 57: Management of Bank Capital-I

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CONCEPTS COVERED

- Constituents of bank capital
- Importance of bank capital

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Major Risks in Banks and Defenses against Risk

- Risks
  - Credit Risk
  - Liquidity Risk
  - Interest Rate Risk
  - Operational Risk
  - Exchange Rate Risk etc.
- Defenses
  - Quality Management
  - Diversification
    - Geographic
    - Portfolio
  - Deposit Insurance
  - Bank Capital

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What is bank capital?

Capital or net worth equals the cumulative value of assets minus the cumulative value of liabilities and represents the ownership of the firm

It is traditionally measured on a book value basis where assets and liabilities are listed in terms of historical cost

In banking regulators include certain forms of debt and loan loss reserves while measuring capital adequacy ratio

Constituents of Bank Capitals

- Common stocks equal the par value of common stock outstanding
- Preferred stocks measured by the par value of any shares outstanding that promise to pay a fixed rate of return
- Surplus equals the excess amount above each share of stock's par value paid
- Undivided profit is the net earnings that have been retained in the business rather than being paid out as dividend
- Equity reserves representing funds set aside for contingencies such as legal action against institution, expected dividends to be paid etc.

Constituents of Bank Capitals …

- Subordinated debentures represent long-term debt capital contributed by outside investors. This instrument may carry a convertible feature, permitting their future exchanges for shares of stock.
- Minority interest in consolidated subsidiaries where the financial firm holds ownership shares in other businesses
- Equity commitment notes, which are debt securities repayable from the sale of the stock

Importance of Bank Capital

- Provides cushion for banks to absorb losses and remain solvent
- Provides ready access to financial markets
- Guards against liquidity problems caused by the deposit outflows
- Reduces risk of failure
- Increases the public confidence

Relative importance of Different Sources of Capital

- Surplus market value of common and preferred stocks
- Retained earnings
- Long term debt
- The relative importance of different components varies across the size of banks

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How much capital a bank should hold?

- Who should set capital standards, market or regulatory agencies?
- What is a reasonable standard for the proper amount of capital?
- Bank capital is regulated
- To limit the risk of failures
- To preserve public confidence
- To limit losses to the government arising from deposit insurance claim

CONCLUSION

- The capitals of the bank include owners' equity, long-term debt, retained earnings etc.
- Capital ratio is the indicator of banking stability and it helps to reduce the risk
- The capital ratio is regulated as it has a larger implication for bank performance and hence the growth process of economy

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- Bank management & financial services by Rose, P. S., & Hudgins, S. C., McGraw-Hill Education, 2008.
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Module 06: Management of Liabilities, Capital and Off-Balance Sheet Activities of Commercial Banks

Lecture 58: Management of Bank Capital-II

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CONCEPTS COVERED

- Basel I
- Capital Adequacy Ratio
- Calculation of capital requirements

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The Basel Agreement: Basel I

- The Basel Agreement of 1988 includes risk-based capital standards designed to:
- Encourage banks to keep their capital positions strong
- Reduce inequalities in capital requirements between countries
- Promote fair competition
- Account for financial innovations (OBS, etc.)
- Stockholders' equity is deemed to be the most valuable type of capital
- Minimum capital requirement increased to 8% total capital to risk-adjusted assets

The Basel Agreement: Basel I

- A Bank's Minimum Capital Requirement is Linked to its Credit Risk
  - The greater the credit risk, the greater the required capital
- Capital is divided into Two Tiers
- Basel I required bankers to determine the current market value for a contract that is similar to the contract they have actually made with a customer in order to figure out the latter's replacement cost.

The Basel Agreement: Basel I

Tier I Capital

- Common stock and surplus
- Undivided profits (retained earnings)
- Qualifying noncumulative perpetual preferred stock
- Minority interests in the equity accounts of consolidated subsidiaries
- Selected intangible assets less goodwill and other intangible assets

Tier II Capital

- Allowance (reserves) for loan and lease losses
- Subordinated debt capital instruments
- Mandatory convertible debt
- Intermediate-term preferred stock
- Cumulative perpetual preferred stock with unpaid dividends
- Equity notes
- Other long term capital instruments that combine debt and equity features

Total Regulatory Capital:

Tier 1 Capital + Tier 2 Capital – investments in unconsolidated subsidiaries – capital securities held by the bank that were issued by other depository institutions and are held under a reciprocity agreement – activities pursued by savings and loan association that may have been acquired by a banking organization but are not permissible for national banks – other items

Basel I: Capital Requirements

- Ratio of core capital (Tier 1) to risk weighted assets must be at least 4 %
- Ratio of total capital (Tier 1 and Tier 2) to risk weighted assets must be at least 8 %
- The amount of Tier 2 capital limited to 100 percent of Tier 1 capital

$$\text{Tier 1 risk based capital ratio} = \frac{\text{Tier 1 capital}}{\text{Total risk weighted assets}}$$

$$\text{Total risk based capital ratio} = \frac{\text{Total capital}}{\text{Risk weighted assets}} = \frac{Total\ (Tier\ 1\ +\ Tier\ 2)\ capital}{Risk\ weighted\ on\ balance\ sheet\ +\ Risk\ weighted\ on\ off\ balance\ sheet\ assets}$$

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Basel I: Capital Requirements

$$\text{Total capital ratio} = \frac{\text{Tier I capital} + \text{Tier II capital}}{\text{Risk Adjusted assets}} \geq 0.08$$

$$\text{Tier I capital ratio} = \frac{\text{Tier I capital}}{\text{Risk Adjusted assets}} \geq 0.04$$

$$\text{Leverage ratio} = \text{Minimum Capital Ratio} = \frac{\text{Tier I capital}}{\text{Total assets}} \geq 0.04$$

Total Capital = (Tier I Capital + Tier II Capital) $\geq$ 0.08 (Risk Adjusted Assets)

Tier I Capital $\geq$ 0.04 (Risk Adjusted Assets)

Basel I: Capital Requirements

- Basel I dictated there should be 4 Risk Groups of Assets
  1. 0.00 items→ 0 % Risk weighting category
  2. 0.20 items → 20 % Risk weighting category
  3. 0.50 items → 50 % Risk weighting category
  4. 1.00 items → 100 % Risk weighting category
- As the credit risk increases so does the capital requirement
- The same 0.00; 0.20; 0.50 and 1.00 apply to off-balance sheet items.

Basel I: Risk Weights Applied to Bank Assets & OBS

Credit Risk Categories for Bank Assets on the Balance Sheet		
Credit Risk Weights Used in the Calculation of a Bank's Risk-Weighted Assets (percentage of amount of each asset)	**Assumed Amount of Credit Risk Exposure from Each Category of Bank Assets**	**Examples of Types of Bank Assets in Each Credit-Risk Category**
0%	Zero credit risk	Cash deposits at the Federal Reserve Banks; U.S. Treasury bills, notes and bonds of all maturities, Government National Mortgage Association (GNMA) mortgage backed securities; and debt securities issued by governments of the world's leading industrial countries.
20%	Low credit risk	Interbank (correspondent) deposits, general obligation bonds and notes issued by states or backed by U.S. government agencies, and mortgage-backed securities issued or guaranteed by the Federal National Mortgage Association (FNMA) or by the Federal Home Loan Mortgage Corporation (FHLMC)
50%	Moderate credit risk	Residential mortgage loans and revenue bonds issued by state and local government units or agencies
100%	Highest credit risk	Commercial and industrial (business) loans, credit card loans, real property, investments in bank subsidiary companies, and all other assets not listed previously

Basel I: Off Balance Sheet

Requires bank to divide each contract's risk into two categories:

1. Potential Market Risk Exposure:-

Risk exposure refers to the danger of loss at some future time if the customer who earned into a market base contract with the bank fails to perform.

2. Current Market Risk Exposure:-

Risk exposure is designed to measure the risk of loss should a customer default today on its contract, which would compel the bank to replace the failed contract with a new one.

Basel I: Risk Weights Applied to Bank Assets & OBS

Credit Risk Categories for Off Balance Sheet Items			
Conversion Factor for Converting Off-Balance-Sheet Items into Equivalent Amounts of On-Balance-Sheet Items	**Credit Risk Weights Used in the Calculation of a Bank's Risk-Weighted Assets (percentage of amount of each asset)**	**Assumed Amount of Credit Risk**	**Examples of Types of Off-Balance Sheet Items in Each Credit-Risk Category**
0.00	0%	Zero credit risk	Loan commitments with less than one year to go
0.20	20%	Low credit risk	Standby credit letters backing the issue of state and local government general obligation bonds
0.20	100%	Modest credit risk	Trade based commercial letters of credit and banker's acceptances
0.50	100%	Moderate credit risk	Standby credit letters guaranteeing customer's future performance and unused bank loan commitments longer than a year
1.00	100%	Highest credit risk	Standby credit letters issued to back repayment of commercial paper

Basel I: Capital Requirements Attached to Derivatives

- Basel I adjusted to account for risk from derivatives-futures, options, interest rate and currency swaps, interest cap and floor contracts and other instruments designed to hedge against changing currency prices, interest rates and positions in commodities
- Many of these derivatives exposed a bank to counterparty risk.
- Risk for many of these instruments is limited because they are traded in organized exchanges.
- Credit-conversion factors for interest rate derivatives are set lower than credit conversion factors for contracts tied to the value of foreign currencies

Basel I: Risk Weights Applied to Bank Assets & OBS

Credit Risk Categories for Derivatives & Other Market-Based Contracts Not Shown on a Bank's Balance Sheet			
Conversion Factor for Converting Interest Rate and Currency into Equivalent Amounts of On-Balance-Sheet Items	**Credit Risk Weights (percentage)**	**Assumed Amount of Credit Risk**	**Categories or Types of Off-Balance Sheet Currency and Interest Rate Contracts**
0.00	50%	Lowest credit risk	Interest rate contracts one year or less to maturity
0.005	50%	Modest credit risk	Interest rate contracts over one year to maturity
0.01	50%	Moderate credit risk	Currency contracts one year or less to maturity
0.05	50%	Highest credit risk	Currency contracts over one year to maturity

Basel I: Calculating Risk-Weighted Assets

1. Compute Credit-Equivalent Amount of Each Off-Balance Sheet (OBS) Item
2. Find the Appropriate Risk-Weight Category for Each Balance Sheet and OBS Item
3. Multiply Each Balance Sheet and Credit-Equivalent OBS Item By the Correct Risk-Weight
4. Add to Find the Total Amount of Risk-Weighted Assets

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Calculating Risk Weighted Assets Under Basel I

Suppose a bank has Rs.6000 in total capital, Rs. 100,00- in total assets, and the following on-balance-sheet and off-balance-sheet (OBS) items

On Balance Sheet Items (Assets)	
Cash	Rs. 5,000
Treasury securities	20,000
Deposit balances held at domestic banks	5,000
Loans secured by first liens on 1- to- 4 family residential properties	5,000
Loans to private corporations	65, 000
Total balance sheet assets	Rs. 100,000
Off-Balance –Sheet –Items	
Stand by letter of credit backing municipal and corporate borrowings	Rs. 10,000
Long-term, legally binding credit commitments to private companies	20,000
Total off-balance-sheet items	Rs. 30,000

Calculating Risk Weighted Assets Under Basel I

- **Banks total capital to total balance sheet asset ratio =** $\frac{6000}{100000} = 6.00\%$
- **Calculation of risk weighted assets:**

Step I: Calculate the credit equivalent amount of each off balance sheet (OBS) item

Off-Balance Sheet Item	Face Value		Conversion factor		Credit Equivalent Amt.
Stand by letter of credit backing municipal and corporate borrowings, asset sales with recourse and repurchase agreement, and forward asset purchases	Rs. 10,000	X	1.00	=	Rs. 10,000
Long-term, legally binding credit commitments to private companies		X	0.50	=	Rs. 10,000
Total off-balance-sheet items	Rs. 2000				

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Calculating Risk Weighted Assets Under Basel I

Step 2: Multiply each balance sheet item & credit equivalent amount of each OBS item by risk weight					
0% Risk-weighting category					
Cash Treasury securities	Rs. 5000 2000 Rs. 25,000	X	0	=	Rs. 0
20% Risk-weighting category					
Deposits at domestic banks Credit equivalent amounts of SLCs backing municipal and corporate borrowings	Rs 5000 10,000 Rs.15,000	X	0.02	=	Rs. 3,000
50% Risk-weighting category					
Mortgage loans secured by first liens on 1- to- 4 family residential properties	Rs. 5000	X	0.05	=	Rs. 2,500
100% Risk-weighting category					
Loans to private corporations Credit equivalent amount of long term credit commitments to pvt. Corporations	Rs. 65,000 10,000 Rs. 75,000	X	1.00	=	Rs. 75,000
Total risk weighted asset held by this bank					Rs. 80.500

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Calculating Risk Weighted Assets Under Basel I

Calculation of risk weighted assets:

$$\text{Capital adequacy ratio under Basel-I} = \frac{\text{Total capital}}{\text{Total risk weighted assets}} = \frac{\text{Total regulatory capital or (Tier 1 + Tier 2 capital)}}{\text{Risk weighted on balance sheet + Risk weighted on off balance sheet assets}}$$

$$= \frac{\text{Rs. } 6000}{\text{Rs. } 80,500} = 0.0745, \text{ or } 7.45\%$$

Note: 7.45% is more than the required minimum of Tier I capital of 4 % but below the combined tier I + Tier II capital requirement of 8%

Basel I: Positive of Risk Adjusted Assets

- Are sensitive to some extent to differences in bank risk taking
- Incorporate off-balance sheet activities into risk assessments
- Do not penalize banks for holding low-risk, liquid assets
- Increase the consistency of rules applied to large banks around the world

Basel I: Problems With Risk Adjusted Assets

- Only deals explicitly with credit risk.
- The concept uses book values rather than market values.
- Other types of risk ignored (operating, liquidity, and legal)
- Portfolio diversification is ignored

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Basel I: 1993 Proposal: Standard Model

- Total Risk= Credit Risk+ Market Risk
- Market Risk= General Market Risk+ Specific Risk
- General Market Risk= Interest Rate Risk+ Currency Risk+ Equity Price Risk + Commodity Price Risk
- Specific Risk= Instruments Exposed to Interest Rate Risk and Equity Price Risk

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Basel I: 1996 Modification: Internal Model

- Internal Model → Value at Risk Methodology
- Tier III Capital (Only for Market Risk)
- i) Long Term subordinated debt
- ii) Option not to pay if minimum required capital is <8%

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Basel I: Value at Risk (VAR) Models

- Suppose a bank estimates its portfolio's daily average value at risk is $100 million over a 10-day interval with a 99 percent level of confidence. Then, if this VaR estimate of $100 million is correct, losses in portfolio value greater than $100 million should occur less than 1 percent of the time. More precisely, the bank's management anticipates losing at most $100 million for 99 out of 100 ten-day intervals.
- An analysis of the bank's historical distribution of losses in its trading portfolio will indicate whether this estimate is reasonable or not.
- Management would want to compare the estimated future loss to the bank's current level of equity capital to make sure the institution is sufficiently capitalized in order to avoid failure
- If management determines that its VaR estimates are rising, the bank must consider either increasing the amount of regulatory define capital it holds in order to absorb the rising level of risk or take steps to reduce its risk exposure.

CONCLUSION

- Minimum capital requirement increased to 8% total capital to risk-adjusted assets
- A Bank's Minimum Capital Requirement is Linked to its Credit Risk
- Capitals are broadly divided into Tier-I and Tier-II
- Proper risk weights are given to calculate the risk weighted assets
- Further, market risk has been added to calculate the risk weighted assets.

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CONCEPTS COVERED

- Pillars of Basel II
- Approaches to measure credit, market and operational risk

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Basel II

- Aims to correct the weaknesses of Basle I
- Three Pillars of Basel II:
  1. **Pillar I: Minimum Capital Requirements**
     Capital requirements for each bank are based on their own estimated risk exposure from credit, market and operational risks
  2. **Pillar II: Supervisory review**
     Supervisory review of each bank's risk assessment procedures and the adequacy of its capital, solvency reports
  3. **Pillar III: Market Discipline**
     Greater disclosure of each bank's true financial condition (market works), capital transparency, capital adequacy, risk measurement and management, risk profiting

Tier 1 Capital

Deemed to have highest capacity to absorbing losses in order to allow banks continue to operate on ongoing basis

- **Common shareholder equity**
- **Disclosed Reserves**
  - ✓ **Published reserves derived from post-tax retained earnings and after dividend payments**
- **Non-cumulative perpetual preferred stock**

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Tier 2 & 3 Capital

Tier 2 cannot exceed 100% of Tier 1 capital

- ✓ Subordinated debt
- ✓ Undisclosed reserves: availability is more uncertain
- ✓ General loan loss reserves
- ✓ Hybrid debt equity capital instruments

Tier 3 can be used to meet a proportion of the capital requirements of market risk

- ✓ Consist of subordinated debt with some limitations

Tier II capital restricted to 100% of Tier-I capital; Long term subordinated debt to be < 50 % of tier-I capital

Tier III to be less than 250 %of Tier-I capital assigned to market risk, i.e., a minimum of 28.5 % of market risk must be covered by tier-I

Basel II: Amends over Basel I

Minimum capital requirements

- Definition of capital is unchanged and the minimum capital requirement remains 8%, but risk-adjusted assets in the denominator will be calculated differently
- Denominator of minimum total capital ratio will consist of 3 parts: the sum of all risk-weighted assets for credit risk, plus 12.5 times the sum of the capital charges for market risk and operational risk
  - ✓ Assuming that a bank has $875 of risk weighted assets credit risk, a market risk capital charge of $10 and an operational risk capital charge of $20, the denominator of the total capital ratio would equal 875 + [(10 + 20) x 12.5)] or $1,250

Basel II: Minimum Capital Requirement (MCR)

$$MCR = \frac{Capital}{Risk\ weighted\ asset\ Credit\ Risk + 12.5[Market\ Risk + Operational\ Risk]} \geq 8\%$$

The total capital ratio must not be lower than 8%

Total risk-weighted assets = Risk weighted assets for credit risk
+ 12.5* Capital for market risk
+ 12.5*Capital for operational risk

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Basel II: Minimum Capital Requirement (MCR)

Capital for credit risk

I. Standardized Approach
II. Internal Ratings Based Approach (IRB)
   - ✓ Foundation
   - ✓ Advanced
III. Credit risk mitigation
   - ✓ CDS & Counterparty risk
   - ✓ Securitization

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Basel II: Minimum Capital Requirement (MCR)

Capital for credit risk

I. Standard approach

Based on ratings of External Credit Assessment Institutions (ECAI), satisfying seven requisite criteria and to be approved by national supervisors. A simplified standard approach (SSA) is also put in place.

Apply fixed risk weighting to assets based on:

- ✓ Type of entity (Sovereign, Commercial bank, Corporates, retail, etc.)
- ✓ Credit rating (AAA, Aaa,…, Bbb)

Basel II: Minimum Capital Requirement (MCR)

Capital for credit risk

II. Internal rating based (IRB) approaches :

Based on the bank's internal assessment of key risk parameters such as, probability of default (PD), loss given at default (LGD), exposure at default (ED), and effective maturity (M) etc.

Two approaches

- ✓ Foundation: Bank produces own loss probability models (i.e. own credit ratings), but uses prescribed estimates of Loss Given Default (LGD) based on ratings
- ✓ Advanced: Bank uses own loss probability models and LGD models

Basel II: Minimum Capital Requirement (MCR)

Capital for market risk

- The risk of losses in on-balance sheet and off-balance sheet positions arising from movements in market prices.

- Following Market risk positions require capital charge:
  1. Interest rate related instruments in trading book
  2. Equities in trading book
  3. Forex open positions

Basel II: Minimum Capital Requirement (MCR)

Capital for market risk

- The capital requirement is

$$k \times \text{VaR} + \text{SRC}$$

where k is a multiplicative factor chosen by regulators (at least 3), VaR is the 99% 10-day value at risk, and SRC is the specific risk charge for idiosyncratic risk related to specific companies

Basel II: Minimum Capital Requirement (MCR)

Capital for market risk cont..

- **The minimum capital required comprises two components:**
  1. **Specific charge for each security**
  2. **General market risk charge towards interest rate risk in the portfolio**

- **<u>Capital charge for interest rate related instruments</u>**

Banks have to follow specific capital charges prescribed by RBI for interest rate related instruments. These charges range from 0 % to 9 % for different instruments and for different maturities.

As regards general market risk, RBI has prescribed 'duration ' method to arrive at the capital charge for market risk (modified duration).

Basel II: Minimum Capital Requirement (MCR)

Capital for operational risk

I. Basic Indicator Approach

II. Standardized Approach

III. Advanced Management Approach

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Basel II: Minimum Capital Requirement (MCR)

Capital for operational risk

I. Basic Indicator Approach:

- ✓ Average over the three years of a fixed percentage (denoted by α = 15%) of positive annual gross income
- ✓ Operational Risk Capital= α* Gross Revenue
- ✓ where α is a percentage set by regulator

Basel II: Minimum Capital Requirement (MCR)

Capital for operational risk

II. Standardized Approach:

- ✓ Bank's activities are divided into 8 business lines such as corporate finance, retail banking, asset management etc.
- ✓ Each business line is assigned a factor say, β, which determines the capital requirement for that business line.
- ✓ Average for three years gives capital for operational risks
- ✓ Operational Risk Capital= β* Gross Revenue per Business Line

Basel II: Minimum Capital Requirement (MCR)

Capital for operational risk

III. Advanced Management Approach

- ✓ Bank's internal risk measurement system is used after due vetting by the supervisor. As a minimum five year observation period of internal loss data is required this method may evolve over a period of time
- ✓ Operational Risk Capital= the risk measure generated by the bank's own operational risk measurement system

Basel II: Capital Standards

Banks are classified as being

1. **Well Capitalized**
2. **Adequately Capitalized**
3. **Under Capitalized**
4. **Significantly Undercapitalized**
5. **Critically Undercapitalized**

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Basel II: Capital Standards

A. Well Capitalized

Total Capital to Risk Adjusted Assets ≥ 0.10
Tier 1 Capital to Risk Adjusted Assets ≥ 0.06
Tier 1 Capital to Total Assets ≥ 0.05 (Leverage Ratio)

B. Adequately Capitalized

Total Capital to Risk Adjusted Assets ≥ 0.08
Tier 1 Capital to Risk Adjusted Assets ≥ 0.04
Tier 1 Capital to Total Assets ≥ 0.04 (Leverage Ratio)

Basel II: Capital Standards

C. Under Capitalized:

(Depository institution that fails to meet one or more of the capital minimums for an adequately capitalized institution)

Total Capital to Risk Adjusted Assets < 0.08
Tier 1 Capital to Risk Adjusted Assets < 0.04
Tier 1 Capital to Total Assets < 0.04 (Leverage Ratio)

D. Significantly Undercapitalized:

Total capital ratio < 0.06
Tier I Capital < 0.03
No pay raises for senior officers, limits on deposit interest rates

E. Critically Undercapitalized:

Tangible equity capital to total assets is ≤ .02

Basel II: Strategies to Meet a Bank's Capital Needs

- **Raising Capital Internally**
  - Dividend Policy
  - Internal Capital Growth Rate
- **Raising Capital Externally**
  - Issuing Common Stock-most expensive
  - Issuing Preferred Stock
  - Issuing Subordinated Notes and Debentures
  - Selling Assets and Leasing Facilities-often creates a substantial inflow of cash
  - Swapping Stock for Debt Securities-may get rid of sinking fund provisions
  - Choosing the Best Alternative

CONCLUSION

- Calculation of capital requirements under Basel-II has been changed with the inclusion of operational risk
- The risk weighted assets are calculated on the basis of credit risk, market risk and operational risk
- Various standard methods have been proposed to measure all these types of risk of the commercial banks

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NPTEL ONLINE CERTIFICATION COURSES

MANAGEMENT OF COMMERCIAL BANKING

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Module 06: Management of Liabilities, Capital and Off-Balance Sheet Activities of Commercial Banks

Lecture 60: Management of Bank Capital-IV

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CONCEPTS COVERED

- Basel II Shortcomings
- Basel-III

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Why Basel-III?

- Capital charge framework for market risk did not keep pace with new market developments and practices
- Capital charge for market risk in trading book calibrated much lower compared to banking book positions on the assumption that markets are liquid and positions can be wound up or hedged quickly
- Capital charge for specific risk (credit risk) in market risk framework (trading book) was lower than capital charge for credit risk in banking book

Why Basel-III?...

- Capital charge for counterparty credit risk for derivative positions also covered only the default risk and migration risk was not captured
- The global financial crisis mostly happened in the areas of trading book /off balance sheet derivatives / market risk and inadequate liquidity risk management
- Banks suffered heavy losses in their trading book
- Banks did not have adequate capital to cover the losses
- Insufficient liquidity assets to raise finance during stressed period

Basel III: Enhancement to Basel II

During Pittsburgh summit in September 2009, the G20 leaders committed to

- Strengthen the regulatory system for banks and other financial firms
- Act together to raise capital standards
- Implement strong international compensation standards aimed at ending practices that lead to excessive risk-taking
- Improve the over-the-counter derivatives market and to create more powerful tools to hold large global firms to account for the risks they take

Consequently, the Basel Committee on Banking Supervision (BCBS) released comprehensive reform package entitled "Basel III: A global regulatory framework for more resilient banks and banking systems" (known as Basel III capital regulations) in December 2010

Basel III

- Originally published in December 2010 in response to the global financial crisis and is expected to be phased in between 2013 and 2019
- Raises both the quality and quantity of required regulatory capital bases
- Objectives
  - Improving banking sector's ability to absorb shocks
  - Reducing risk spillover to the real economy
- Fundamental reforms proposed in the areas of
  - Micro prudential regulation – at individual bank level
  - Macro prudential regulation – at system wide basis

Basel III

- Basel III reforms strengthen the bank-level i.e. micro prudential regulation, with the intention to raise the resilience of individual banking institutions in periods of stress
- The reforms have a macro prudential focus- addressing system wide risks, which can build up across the banking sector, as well as the procyclical amplification of these risks over time
- The macro prudential aspects of Basel III are largely enshrined in the capital buffers
- Both the buffers i.e. the capital conservation buffer and the countercyclical buffer are intended to protect the banking sector from periods of excess credit growth

Basel III

- Basel III strengthens the Basel II framework rather than replaces it
- Whereas Basel II focused on the asset side of the balance sheet, Basel III mostly addresses the liabilities, i.e. capital and liquidity
- The new framework will
  a. Impose higher capital ratios, including a new ratio focusing on common equity
  b. Increase capital charges for many activities, particularly involving counterparty risk
  c. Narrow the scope of what constitutes tier 1 (T1) and tier 2 (T2) capital

Basel III: Framework

The Basel framework (continues to) consists of three pillars:

1. Pillar 1 : Calculations of regulatory capital requirements for credit, market and operational risk.
2. Pillar 2 : Process by which a bank should review its overall capital adequacy and the process under which the supervisors evaluate how well financial institutions are assessing their risks and take appropriate actions in response to the assessments
3. Pillar 3: Disclosure requirements for banks to publish certain details of their risks, capital and risk management, with the aim of strengthening market discipline. This is intended to improve effective risk management by allowing for comparison of the performance across sectors through these disclosure requirements.

Basel III: Framework-Capital

To improve the quality, consistency and transparency of the capital base the following changes are proposed under the new Basel III framework:

1. Increase of requirements on minimum Tier 1 (T1) capital
2. Increase in the standards for instruments to qualify as T1 capital
3. Harmonization of Tier 2 (T2) capital instruments and the elimination of Tier 3 (T3) capital
4. Revision of appropriate capital deductions such as minority interests and deferred tax assets

Basel III: Framework-Capital

The new minimum capital ratio:

- **The minimum requirement for common equity will be raised from the current 2% level to 4.5%**
- **T1 capital requirement will increase from 4% to 6%**
- **The capital conservation buffer above the regulatory minimum requirement must be calibrated at 2.5% and be met with common equity countercyclical buffer within a range of 0-2.5% of common equity or other fully loss-absorbing capital is implemented according to national circumstances.**
  - ✓ **This buffer is to be implemented by the national supervisor when there is excessive credit growth in the economy**
  - ✓ **These buffers are designed to restrict the bank's ability to distribute its earnings until the buffers are rebuilt**

Basel III: Framework-Capital

- Systematically important financial institutions (SIFIs): global financial services firms - almost exclusively banks - so big that governments believe they will be forced to rescue these institutions rather than risk lasting damage to the world financial system
- SIFIs should have loss absorbing capacity beyond the standards announced
- The additional loss absorbency requirements are to be met with a progressive Common Equity Tier 1 (CET1) capital requirement ranging from 1% to 2.5%, depending on a bank's systemic importance
- For banks facing the highest SIB (systemically important bank) surcharge, an additional loss absorbency of 1% could be applied as a disincentive to increase materially their global systemic importance in the future

Basel III: Framework-Capital

Tier 1 capital: intended to ensure that each bank remains a "going-concern"

- ✓ **Highest quality form of a bank's capital as it can be used to write off losses**
- ✓ **Innovative hybrid capital instruments with step-up clauses are being phased out**
- ✓ **Not included (i.e. deductions) in common equity are among others goodwill, minority interest, deferred tax assets, provisioning shortfalls, bank investments in its own shares and bank investments in other banks, financial institutions and insurance companies (to avoid double counting of equity)**

Basel III: Framework-Capital

Tier 2 capital: intended to protect depositors in the event of insolvency; re-categorized as a "gone-concern" reserve

- ✓ **Subordinated debt remains eligible as T2 capital**

Tier 3 capital is to be completely abolished

- ✓ **T3 capital is short-term subordinated debt and was used under Basel II to support market risk from trading activities**

Basel III: Framework-Risk Coverage

Counterparty credit risk:

(Measures intended to address perceived deficiencies in Basel II during periods of acute market volatility)

- ✓ **Capital requirements must be determined using "stressed" inputs when calculating counterparty credit risk**
- ✓ **Banks must implement a new capital charge - credit value adjustment (CVA) - to cover the risk of mark-to-market losses on the expected counterparty risk to OTC derivatives; this is additional to default risk capital charge**

Basel III: Framework-Risk Coverage

- **Banks must implement a new capital charge for wrong-way risk.**
  - **Wrong-way risk: risk that arises when (credit) exposure at default is positively (adversely) correlated with the probability of default (i.e. the credit quality of the counterparty)→when default risk and credit exposure increase together**
  - **This will be achieved by adjusting the multiplier applied to the exposure amount identified as wrong way risk.**
- **Apply a multiplier of 1.25 to the asset value correlation (AVC) of exposures to regulated financial firms with assets of at least $25 bn., since AVC's were 25% higher during the crisis for financial versus non-financial firms**

Basel III: Framework-Risk Coverage

- Banks will be required to apply tougher (longer) margining periods (potential losses may occur over a longer specified period of time) to determine capital requirements when they have large and illiquid derivative exposures to a counterparty
- Lower risk weightings (even zero weights) for counter-party risk exposure may be applied if they deal with centralized exchanges that meet certain criteria

Basel III: Capital Leverage Ratio

Leverage ratio is intended to serve as a simple non-risk based metric to supplement risk-based requirements

$$\frac{Tier\ 1\ capital}{Exposure\ measure} \geq 3\%$$

- **As a Pillar 2 measure to start with but will be integrated with Pillar 1**
- **Leverage ratio will be tracked from January 1, 2011 to see the result of the above definition and parallel run from January 1, 2013 to 2017 and final adjustment in 2017 – Disclosure from January 2015**
- **As Pillar 1 ratio from January 1, 2018**

Capital Regulations in India

	Regulatory Capital	As % to RWAs
(i)	Minimum Common Equity Tier 1 Ratio	5.5
(ii)	Capital Conservation Buffer (comprised of Common Equity)	2.5
(iii)	Minimum Common Equity Tier 1 Ratio plus Capital Conservation Buffer [(i)+(ii)]	8.0
(iv)	Additional Tier 1 Capital	1.5
(v)	Minimum Tier 1 Capital Ratio [(i) +(iv)]	7.0
(vi)	Tier 2 Capital	2.0
(vii)	Minimum Total Capital Ratio (MTC) [(v)+(vi)]	9.0
(viii)	Minimum Total Capital Ratio plus Capital Conservation Buffer [(vii)+(ii)]	11.5

Basel III: Liquidity Metrics

- Key characteristic of the financial crisis was inaccurate and ineffective management of liquidity risk
- Two standards/ratios proposed
  - Liquidity Coverage Ratio (LCR) for short term (30 days) liquidity risk management under stress scenario
  - Net Stable Funding Ratio (NSFR) for longer term structural liquidity mismatches

Basel III: Liquidity Metrics

Liquidity Coverage Ratio (LCR)

Designed to ensure that a bank maintains an adequate level of unencumbered assets that can meet its liquidity needs for a 30-day period under a severe stress scenario

$$LCR = \left(\frac{High\ Quality\ Assets}{Net\ cash\ flow\ over\ a\ 30-day\ stress\ period} \right) \geq 100\%$$

*High quality assets include those that can easily be converted into cash in stressed markets

Basel III: Liquidity Metrics

- **Fundamental characteristics of liquid assets**
  - ✓ Low credit and market risk
  - ✓ Ease and certainty of valuation
  - ✓ Low correlation with risky assets
  - ✓ Listed in a developed and recognized exchange
- **Market-related characteristics**
  - ✓ Active and sizable market
  - ✓ Presence of committed market makers
  - ✓ Low market concentration
  - ✓ Flight to quality

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Basel III: Liquidity Metrics

Net Stable Funding Ratio (NSFR)

Designed to ensure that a bank holds an amount of long-term funding at least equal to its long-term assets, such as lending

$$NSFR = \frac{Available\ Stable\ Funding}{Required\ Stable\ Funding} \geq 100\%$$

This measure depends on the ability of firms and supervisors to model investor behavior, which is "stable" or "unstable" in a crisis situation

CONCLUSION

- Basel-III is an extension of Basel-II, which raises both the quality and quantity of required regulatory capital bases
- The basic objective of Basel-III is to capture the dynamics of the market fluctuations
- Importance has been given to liquidity of the commercial banks with other bank risks

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