INTRODUCTION

1. 1970s marked by indiscriminate cross-border lending by globally active banks in developed countries, accompanied by a precipitous decline in their capital ratios.
2. 1980s witnessed a string of bank failures in U.S. and Europe.
3. In response to the above developments, the BCBS (Basel Committee on Bank Supervision) recommended the adoption of risk-based capital standards by globally active banks in July 1988 (Basel Accord – I)

BASEL ACCORD – I

1. **RWA (risk weighted assets). Assets divided into 4 categories carrying risk weights respectively of 0%, 25%, 50% and 100%.**
2. **Distinction between 2 types of capital**
    1. Core capital (Tier 1)
    2. Supplementary capital (Tier 2)

   Tier 2 capital < 50% of Total Tier 1 and 2 capital.
3. **Off Balance Sheet Items converted into risk assets by the use of conversion factors (4 conversion factors).**
4. **Limitations:**
    1. **Differential weights for OECD and non-OECD exposures.**
    2. **Exclusive focus on credit risk.**
    3. **"One hat fit all" approach (no distinction between sound and weak banks).**
    4. **Inadequate treatment of off balance sheet items.**

Basel Accord – II

1. **Three Pillars:**
    1. Minimum Capital Requirement
    2. Supervisory Review
    3. Market Discipline
2. **Three types of Risks are distinguished**
    1. Credit Risk
    2. Market Risk
    3. Operational Risk
3. **Introduction of an additional type of capital – Tier 3.**

First Pillar: Credit Risk

1. **Two alternative approaches**
    1. Standardized Approach very similar to Basel except that the risk weights are not determined once for all but linked to ratings of the counterparties (to bank claims) as determined by external credit rating agencies.
    2. IRB (internal ratings based) approach, in which banks calculate their own risk exposures subject to overall calibration of their models by the supervisory authority (VAR Models)
2. **Major Features of Standardized Approach**
    1. Risk weights for various ratings stipulated by regulator: e.g., an exposure to a sovereign carrying a rating of A+ to A- (2nd highest rating) carries a risk weight of 20%, while an exposure to a corporate with the same rating has a risk weight of 50%.
    2. Credit risk mitigation (adjustment of risk weights for a collateralised exposure).

Credit Risk: IRB Approach

1. Certain preconditions insisted upon before a bank qualifies for IRB approach.
2. The two key components are (i) risk components and (ii) a risk weight function.
3. Risk Components:
    1. Six Exposure Classes Identified (sovereigns and PSEs, other banks, corporates, retail loans, project finance, equity investments)
    2. PD (probability of default) estimated for each broad exposure class.
    3. LGD (loss given default) for any given exposure.
    4. EAD_i (exposure at fault) is defined as

$$EAD_i = PD_i \times LGD_i$$

where PD_i is the probability of default of the broad class to which the i^{th} exposure belongs and LGD_i is the loss given default of the i^{th} exposure.

Credit Risk: IRB Approach

4.Risk Weight Function

For each broad category of exposure a benchmark risk-weight table is specified. Illustratively for corporate exposures, the benchmark risk weight table looks like the following:

PD (Prob. Of Default)	BMW (Benchmark risk-weight)
0.03%	14
0.05%	19
0.1%	29
0.2%	45
.....	
10%	482
15%	588

The actual risk weight to any exposure is then defined as

$$RW = \min\left[\frac{LGD}{50} \times BMW;\quad 12.5 \times LGD\right]$$

Where the risk weight RW and LGD (loss given default), BMW (Benchmark risk weight) are all referring to the particular exposure.

Note: LGD is expressed as a whole number (75% loss given default is written as simply 75).

Total RWA (Risk Weighted Assets) = $\sum_i (RW)_i (EAD)_i$ **(Summation over all exposures)**

Market Risk: Standardized Approach

1. Two alternative approaches
   1. Standardized Approach
   2. Internal Rating Based (IRB) Approach
2. Standardized Approach

   5 distinct sources of market risk are identified viz., interest rate risk, equity position risk, forex risk, commodities risk, options trading risk.
3. Illustration of capital charges for interest rate risk
   1. Specific interest rate risk (adverse movements in the price of an individual security owing to factors related to individual issues)
   2. General risk (arising from movements in market interest rates).
4. Specific interest rate risk.

   Three types of securities
   1. Government
   2. Qualifying (securities of multilateral development banks, PSEs, securities rated as investment grade by at least 2 rating agencies)
   3. Others.

Specific Risk Charges

Security Type	Residual Maturity	Risk Charge
Government	All	0%
Qualifying	≤ 6 months	0.25%
	6 – 24 months	1.00%
	≥ 24 months	1.60%
Others	All	8%

Similarly general interest risk charges try to capture the likely loss arising from specific yield changes. The assumed yield changes and the corresponding risk weights for various residual maturities are given below.

Residual Maturity	Risk Weight	Assumed Changes in yield
≤ 1 month	0.0%	1.00
1-3 months	0.20%	1.00
3-6 months	0.40%	1.00
1-2 years	1.25%	0.90
5-7 years	3.25%	0.90
10-15 years	4.50%	0.60
> 20 years	12.50%	0.60

Market Risk: IRB Approach

1. Concept of Value-at-Risk (VaR)

A VaR estimate is simply an appropriate percentile of the bank's portfolio loss distribution, e.g., If 99% VaR estimate of a bank is Rs.50 lakhs, it means that there is only 1% chance that the bank's portfolio loss will exceed Rs.50 lakhs.

2. Three crucial concepts in a VaR

(i) Confidence coefficient (95%, 99% or 99.9%)

(ii) Historical period used for estimating VaR model

(iii) Holding period (period over which portfolio is assumed to be held constant).

Basel II proposes a confidence coefficient of 99%, a holding period of 10 days and a historical observation period of at least 1 year.

Capital Requirement (Daily) = Max {Previous day VaR estimate; (Average of VaR of preceding 60 working days) x m}

m (multiplication factor) = 3 + δ

Minimum value of δ = 0 (bank performance good)

Maximum value of δ = 1 (poor bank performance)

Operational Risk

Standardized Approach

For each type of banking business, typical business lines are identified. For example, for commercial banking the major identified business lines include (i) Retail Banking (ii) Commercial banking (iii) Payment and Settlement (iv) Investment, etc.

It is recognized that the financial indicator to calculate the operational risk may depend on the business line chosen.

The relative weight of a business line ℓ may be denoted as B_ℓ and is supposed to be country-specific. Basel II merely specifies a broad range for B_ℓ allowing the country regulator to determine the exact relative weight of a business line (within the range).

Risk factor β_ℓ (corresponding to line of business ℓ) is defined as

$$\beta_\ell = \frac{(20\%) \times B_\ell}{\sum(\text{relevant financial indicator over all banks in the country})}$$

Operational Risk

Regulatory capital charge for operational risk of a bank is

$$\sum_{\ell} \{\beta_{\ell} \times (\text{appropriate indicator})\}$$

Type of Bank	Business Line	Financial Indicator	Relative Weight
Investment Banks	Corporate Finance	Gross Income	8-12%
	Trading & Sales	Gross Income	15-23%
	Retail Banking	Annual Av. Assets	17-25%
Commercial Banks	Corporate Banking	Annual Av. Assets	13-20%
	Payment & Settlement	Annual Settlements	12-18%
	Retail Brokerage	Gross Income	6-9%
Others	Asset Management	Total Funds Managed	8-12%

Basel II : Second & Third Pillars

1. Second Pillar (Supervisory Review Process

(i) Supervisors should be able to prescribe higher capital adequacy ratios for specific banks.

(ii) Banks should develop internal procedures for assessing overall capital adequacy in relation to their risk profiles.

(iii) Strategies and procedures adopted in (ii) should be open to supervisory review.

(iv) Prompt corrective action by supervisors.

2. Third Pillar (Market Discipline)

Stress disclosures by banks to enable counterparties (to bank transactions) make well-founded risk.

Salient components of disclosure information

(i) Structure and components of bank capital

(ii) Accounting policies used for valuation of assets and liabilities

(iii) Risk exposures and risk management strategies

(iv) Capital ratio and main features of its capital instruments.

Macroeconomic Implications of Basel II

1. Capital adequacy and the aggregate economy

(i) Possibility of increased capital adequacy leading to a credit crunch (Jackson et al (1999)), which may affect real output if many firms are bank-dependent.

(ii) Monetary transmission affected via the emergence of a financial accelerator (van den Heuvel (2002)).

(iii) Differential effects of monetary policy on poorly capitalized and adequately capitalized banks (Tanaka (2002)).

(iv) Pro-cyclicality (Ghosh & Nachane (2003)).

2. Cross-sectional Implications

(i) Restriction of credit supply to high-rated borrowers

(ii) Special problems for SMEs (Basel directive of July 2002)

(iii) Basel II may curtail credit supply to borrowers based in LDCs (Ferri et al (1999)

(iv) Impact on Capital Flows to EMEs.

Basel II and India

Likely Implications

(i) Basel II may lead to increased capital requirements in all banks across the board.

(ii) Likely pressures on interest rate spreads.

(iii) Unsolicited ratings and low penetration of ratings.

(iv) High-risk assets may flow to weaker banks who are more likely to be adopting a standardized approach.

(v) Anomaly between prescribed risk weights for unrated entities and entities with lowest rating.

(vi) Success of Basel II contingent upon good corporate governance.