IMPORTANCE & APPLICATION OF RAROC (RISK ADJUSTED RETURN ON CAPITAL)

□ Why is Fair Pricing of Credit Important? □

- Ensures **good profit** □ for banks and fair cost for borrowers □.
- Helps in **managing risks** □ and maintaining financial health □.
- Affects bank stability in terms of **capital adequacy, loan quality & earnings** □.

□ How Banks Decide Loan Interest Rates? □

Factors □	What it Means? □
Cost of Funds □	How much the bank pays to get money
Desired Profitability □	Expected profit from lending
Risk Factors □	Risk involved in giving the loan

Factors □	What it Means? □
Customer Relationship □	Long-term value of borrower
Market Competition □	Competitor bank rates

- **Long-term loans** □: Interest rates depend on financial institution rates, economic conditions & RBI guidelines.
- **Better credit ratings** □ = Lower loan interest rates □✅
- **Loan Pricing Mechanism** □: Banks follow different pricing models like **BPLR, Base Rate, MCLR, EBLR** □.
- RBI introduced **External Benchmarking** □ to improve transparency in loan pricing □.

□ Why Do Interest Rates Differ for Customers? □

- Borrowing time affects rates □ (Old vs. New Customers □□).
- Bank's business strategy □ (New customer acquisition = Discounted rates □).
- **Relationship Banking** □ (Existing customers get better rates □✅).
- Policy rate fluctuations □□ impact interest rates.

□ How to Ensure Fair Loan Pricing? ✓

- Banks use **Risk-Adjusted Return on Capital.** 📊 to measure risk-adjusted returns.
- Helps in setting fair rates based on **risk & capital employed** □.
- Ensures **profitability** □ while keeping loans affordable for customers □.

□ 8.3 Theory of Interplay Between Return, Capital & Risk □

□ What is RAROC? □

- **Developed in 1970s** by Dan Borge □.
- Used by banks to **assess loan risk and returns** □.
- Similar concepts: **RORAC (Return on Risk-Adjusted Capital)** and **RARORAC (Risk-Adjusted Return on Risk-Adjusted Capital)** □.

□ Key Elements of Risk Pricing Model □□

Factor □	Meaning □
Interest Rate □	Cost of borrowing funds
Default Risk □	Chances of borrower not paying back
Recovery Rate □	Amount bank can recover in case of default

□ How Banks Manage Risk in Loan Pricing? □

Approach □	What it Does? □
Risk Factor Premium □	Adds credit risk premium to pricing
Credit Fundamentals □	Uses company financials to predict defaults
Macroeconomic Approach □	Separates industry risks from company risks

□ Real-Life Examples □□

Example 1: How Loan Rates Vary Over Time? □

Person A □ took a home loan in 2019 at 8% interest □ Person B □ took the same loan in 2023 but at 9.5% □ □ Why? Because policy rates increased □.

Example 2: Impact of Credit Rating on Loan Rates □

- **Company X** (AAA-rated □) gets a business loan at **7% interest**.
- **Company Y** (BB-rated □) gets a loan at **11% interest**. □ Why? **Higher risk = Higher loan cost** □.

□ 8.3.1 Risk-Adjusted Performance Measures (RAPMs) □

- These are financial metrics used to **evaluate the performance of an investment** while considering the risk taken to achieve returns.
- These measures help in **comparing different investments by adjusting for risk**, ensuring that higher returns are not just a result of higher risk-taking.

📌 8.3.2 RORAC (Return On Risk-Adjusted Capital) 🏢

- RORAC is a financial metric that helps in evaluating the profitability of an investment while **considering the capital at risk.**
- It is mainly used to **compare different projects or investments** that have different levels of risk.

Formula □ RORAC = Net Profit / Risk Capital □

- Used to **compare projects with different risk levels**.
- More precise than **Internal Rate of Return (IRR)** □.
- Similar to **Return on Equity (ROE)**, but adjusted for risk □.
- Applied in **long-term investment assessments** □.

A company is evaluating two investment projects . **Project X** has a **net profit** of ₹500 crore and **risk capital** of ₹2,500 crore. **Project Y** has a **net profit** of ₹500 crore and **risk capital** of ₹3,500 crore. **Using the RORAC formula, calculate the RORAC for both projects and determine which one is better.**

Formula 📌 RORAC = Net Profit / Risk Capital 💰

📌 8.3.3 RARORAC (Risk Adjusted Return On Risk Adjusted Capital) 📉

- RARORAC is a financial metric used to measure the return generated by an **investment after adjusting both the return and the capital for risk.**
- It is an **improved version of RAROC** (Risk-Adjusted Return on Capital) because it considers not just risk-adjusted profits but also risk-adjusted capital.

Formula **(Net Profit - Risk Cost x Risk Capital) / Risk Capital**

- Enhances risk-adjusted profitability calculations ✅
- Follows **Basel III guidelines** for risk management 🏦.
- Helps in **capital allocation and business performance measurement** 📊.

A company is evaluating two projects: **Project A** has a **net profit** of ₹800 crore, **risk capital** of ₹4,000 crore, and **risk cost** of **5%**. **Project B** has a **net profit** of ₹600 crore, **risk capital** of ₹3,500 crore, and **risk cost** of **4%**.

Formula **(Net Profit - Risk Cost x Risk Capital) / Risk Capital**

8.3.4 RAROC (Risk-Adjusted Return On Capital)

- RAROC is a financial metric used to **measure the return an investment generates after adjusting for risk.**
- It helps banks, investors, and companies understand whether they are getting enough return for the risk they are taking.
- Used for **loan pricing & financial risk evaluation** 📉.
- Considers **credit risk, operational risk & market risk** 📊.
- Recommended by **RBI's Working Group** for fair loan pricing.

$$RAROC = \frac{(Interest\ Income - Expenses) + (Non - Interest\ Income) - Expected\ Loss}{Regulatory\ Capital} \times (1 - \text{Tax Rate})$$

Regulatory capital = Credit Risk Capital + Operational Risk capital.

Credit Risk capital = Average Utilization * x CCF (%) × Risk weight (%) x CRAR (%)

- Average utilisation is **average of each quarter end outstanding during the year** (or) outstanding as at end of year, whichever is higher, **after adjusting eligible financial collaterals.**

- (CRAR %) i.e. Capital to Risk Weighted Assets Ratio is the minimum regulatory mandate.

Operational risk capital is 15% of gross income i.e. (Basic Indicator Approach), where Gross income = (Interest Income - Expenses) + Non Interest Income

Credit Conversion Factor: The credit risk exposure has to be first calculated by multiplying the face value of each of items by 'credit conversion factor

(CCF) Rates:

- Fund-Based Credit (FB CC) and Term Loans (TL): **100%**
- Letters of Credit (LC): **20%**
- Performance Bank Guarantees (BG): **50%**
- Financial Bank Guarantees (BG): **100%**
- Derivatives: **15%**
- Undrawn portion of CC/OD ≥ INR 150 crore: **20%** (irrespective of cancellability clause).

3. Risk Weights

- Based on credit ratings from domestic rating agencies:

Rating	Risk Weight
AAA	20%
AA	30%
A	50%
BBB	100%

BB & below	150%
Unrated	100% (or 150% if exposure > INR 200 crore or > INR 100 crore for previously rated entities)

- **Additional Rules**:
- Real estate exposure risk weights vary by size and sector.
- Sovereign guarantees and credit guarantee covers reduce risk weights:

Guarantee Type	Risk Weight
Central Government	0%
State Government	20%
ECGC	20%
Bills discounted under LC	20%

Expected Loss: It is that part of the **average anticipated credit loss that happens in the normal course of business** due to default in exposures and for which banks have to either make provisions or price these effects into their loans

Expected Loss=EAD×PD×LGD

EAD (Exposure at Default): EAD is an estimation of the extent to which a bank may be exposed to a borrower at the time of that borrower's default

PD (Probability of Default): Likelihood of borrower defaulting (borrower-specific).

LGD (Loss Given Default): Loss suffered if default occurs (1 - Recovery Rate).

5. Function of Regulatory Capital

- Covers **Unexpected Losses** (losses beyond expected losses).
- **Unexpected Loss** = Standard deviation of expected losses.
- Regulatory capital acts as a cushion against these unexpected losses.

A bank is evaluating a loan portfolios using **RAROC**: **Interest Income** = ₹2,000 crore , **Expenses** = ₹500 crore , **Non-Interest Income** = ₹300 crore , **Expected Loss** = ₹200 crore , **Regulatory Capital** = ₹4,000 crore , **Tax Rate** = 30% , calculate the RAROC

$$RAROC = \frac{(Interest\ Income - Expenses) + (Non - Interest\ Income) - Expected\ Loss}{Regulatory\ Capital} \times (1 - \text{Tax Rate})$$

8.4 Application of RAROC

- **Risk-gain pricing** is key to effective risk management ✅
- **High-risk borrowers** = Higher interest rates .
- Banks should build **data-driven pricing models** based on:
  - Probability of default .
  - Loan loss provisions .
  - Market forces & future business potential .
- **RAROC ensures fair loan pricing** by covering both **expected & unexpected losses** .
- **Price-cutting without considering risk** can lead to **mispricing & financial instability** .

Uses of RAROC Models :

1 Loan Pricing .

2 Credit Sanctioning Decisions .

3 Business Segment Profitability Comparison .

8.5 RORWA (Return on Risk Weighted Assets)

RORWA is measure of lender's **net earnings on various risk weighted assets** and also an indicator of risk weighted **profitability of a product, portfolio, unit or institution.**

RORWA = (Net Income/ Risk Weighted Assets) × 100

Two banks, **Bank A** and **Bank B**, are being compared based on their **risk-adjusted profitability using RORWA**. **Bank A** has a **net income** of ₹1,200 crore and **risk-weighted assets (RWA)** of ₹12,000 crore, while **Bank B** has a **net income** of ₹1,500 crore and **RWA** of ₹20,000 crore. Calculate the RORWA for both banks.

8.5.1 Application of RORWA

Use Case	What It Shows?
Product-Level RORWA	Performance of a specific banking product
Portfolio-Level RORWA	Profitability of a loan portfolio
Unit/Branch-Level RORWA	Efficiency of a specific business unit
Industry Benchmarking	Comparison with competitors

Summary Table

Concept	Definition	Key Application
RAROC	Risk-Adjusted Return on Capital	Loan Pricing & Risk Management
RORAC	Return on Risk-Adjusted Capital	Investment Decisions
RARORAC	Risk-Adjusted Return on Risk-Adjusted Capital	Performance Benchmarking
RORWA	Return on Risk Weighted Assets	Measuring Portfolio & Product Profitability