

**Credit Risk****Part II : Day to Day Operations****5 Sections**

- Section I : Qualitative Techniques for evaluation and Credit Risk Management
- Section II : Credit Scoring Model for Retail Customers
- Section III : ALTMAN Z-Score for Corporate Customers.
- Section IV : Credit Risk Rating - Process and Scales
- Section V : Credit Risk Mitigation

**Section I : Qualitative Techniques for evaluation and Credit Risk Management**

*Banks should have a well defined Credit Appraisal Matrix. This Matrix primarily centers around 5C's of credit evaluation.*

**Five C's of Credit Analysis**

- **Characters** : Reflects willingness to pay (Judged by checking credibility, asking for references , past payment history etc).
- **Capital** : Borrower should have adequate capital i.e., own funds so that it can act as a cushion against unexpected losses.
- **Capacity\*** : Ability to pay (Judged via financial statement analysis,cash flow analysis and working capital analysis ).
- **Collateral** : Adequacy & Safety- need to look at legal and liquidity aspect of non cash collateral.
- **Conditions** : External environment, purpose of the loan etc.

## \*Capacity to pay of a Corporate Client

To judge the capacity, i.e., ability to pay of a corporate borrower, we carry out-

- i. Financial Statement Analysis
- ii. Cash flow Analysis
- iii. Working Capital Analysis

### i. Financial Statement Analysis (Ratio Analysis)

Category I	
Profitability Ratios	
Margin Type (Higher the better)	Return Type (Higher the better)
<ul style="list-style-type: none"> <li>Gross Profit Margin = <math>\frac{GP}{Sales} \times 100</math></li> </ul>	<ul style="list-style-type: none"> <li>ROCE = <math>\frac{\text{Operating Profit}}{\text{Operating Capital Employed}} \times 100</math> (Where Operating Capital Employed = Total Core Asset - CL)</li> </ul>
<ul style="list-style-type: none"> <li>Operating Profit Margin = <math>\frac{\text{Operating Profit}}{Sales} \times 100</math></li> </ul>	<ul style="list-style-type: none"> <li>ROE = <math>\frac{PAT}{\text{Net Worth}} \times 100</math></li> </ul>
<ul style="list-style-type: none"> <li>Net Profit Margin = <math>\frac{\text{Net profit}}{Sales} \times 100</math></li> </ul>	<ul style="list-style-type: none"> <li>ROA = <math>\frac{PAT}{\text{Total Asset}} \times 100</math></li> </ul>

**Note :** Usually operating profit is the same as EBIT but it is not necessary. Similarly usually we have capital employed as a single figure rather than operating capital employed and overall capital employed.

Category II
Performance - turnover - efficiency - activity ratios (higher the better)
<ul style="list-style-type: none"> <li>Sales growth rate</li> </ul>
<ul style="list-style-type: none"> <li>Net Fixed Asset Turnover Ratio = <math>\frac{Sales}{\text{Net Fixed Asset}}</math> (Efficiency of FA Management)</li> </ul>
<ul style="list-style-type: none"> <li>Inventory Turnover ratio = <math>\frac{COGS}{\text{Trade Stock}}</math> (Efficiency of Inventory Management)</li> </ul>
<ul style="list-style-type: none"> <li>Debtors turnover ratio = <math>\frac{Sales}{\text{Trade Debtors}}</math> (Efficiency of Debtors Management)</li> </ul>

Category III : Long Term Solvency Ratio i.e., leverage ratios	
Coverage Ratio(Higher the better)	Capital Structure Ratio(Lower the safer)
<ul style="list-style-type: none"> <li>Interest Coverage Ratio = <math>\frac{EBIT}{\text{Interest}}</math></li> </ul>	<ul style="list-style-type: none"> <li><math>\frac{\text{Total Debt}}{\text{Tangible Net Worth}}</math> Where Tangible Net worth = Net worth -</li> </ul>
<ul style="list-style-type: none"> <li>Debt Service Coverage ratio (std norm = 1.5)</li> </ul>	

$$= \frac{(\text{PAT} + \text{Interest} + \text{Depreciation})}{\text{Interest} + \text{Repayment of loan}}$$

Intangible Assets

#### Category IV : Liquidity Ratio - Short Term Solvency Ratio ( Higher the Ratio, better the liquidity)

$$\text{Current Ratio} = \frac{\text{CA}}{\text{CL}} - \text{Standard norm} = 2$$

$$\text{Quick Ratio ( Also known as Acid Test Ratio)} = \left( \frac{\text{CA-Stock}}{\text{CL}} \right) - \text{Standard norm} = 1$$

### ii. Cash Flow analysis

- **CFO** - Must be positive and rising
- **CFI** - Should be negative, i.e., firm is growing by investing in property, plant and equipment.
- **CFF** - It should be positive but it would be safer if too much of funds are not being raised from debt financing. Also we would like to see firm's dividend payment or buyback program.

**Note :** Sometimes they may ask for liquidity and cash flow analysis together.

### iii. Working Capital Analysis

**Accounts Receivable Days =**

$$\frac{\text{Debtors}}{\text{Credit Sales}} \times 365 - \text{Lower the better} - \text{it means we are collecting debtors faster.}$$

$$\text{Inventory Days} = \frac{\text{Inventory}}{\text{COGS/Sales}} \times 365 - \text{Lower the better} - \text{It means faster processing of materials.}$$

**Payable Days =**

$$\frac{\text{Creditors}}{\text{Credit Purchases}} \times 365 - \text{Higher the better} - \text{It means we are utilising credit facility provided by suppliers.}$$

***See case study 1 of may 2018 ( also see suggested answer)***

## Section II : Credit Risk Rating - Process and Scales

Internal Rating	External Rating
<p>These ratings are developed by banks own internal methodologies which consider PD and LGD. We had discussed the calculation of PD via three methods -</p> <ul style="list-style-type: none"> <li>• <b>Pooling</b></li> <li>• <b>Statistical</b></li> <li>• <b>Structural</b></li> </ul> <p>Similarly we had discussed three types of LGD-</p> <ul style="list-style-type: none"> <li>• <b>Cyclical (PIT)</b></li> <li>• <b>Long run (TTC)</b></li> <li>• <b>Downturn LGD</b></li> </ul>	<p>From rating agencies*</p> <p><b>Few leading credit rating agencies in India are as follows:</b></p> <ul style="list-style-type: none"> <li>• Credit Rating Information Services of India Limited (CRISIL)</li> <li>• Indian Credit Rating Agency (ICRA)</li> <li>• Credit Analysis and Research Ltd (CARE)</li> <li>• Fitch Ratings India Private Limited (Fitch)</li> <li>• Equifax</li> <li>• Credit Information Bureau India Limited (CIBIL)</li> <li>• High Mark Credit Information Services</li> <li>• SME Rating Agency of India Ltd (SMERA)</li> <li>• <b>Brickwork Rating India Private Limited (Brickwork)</b></li> </ul>

**\*Rating Scale for Long term instruments is as follows:**

<b>AAA (Highest Safety)</b>	Instruments with this rating are considered to have the highest degree of safety regarding timely servicing of financial obligations. Such instruments carry lowest credit risk.
<b>AA (High Safety)</b>	Instruments with this rating are considered to have high degree of safety regarding timely servicing of financial obligations. Such instruments carry very low credit risk.
<b>A (Adequate Safety)</b>	Instruments with this rating are considered to have adequate degree of safety regarding timely servicing of financial obligations. Such instruments carry low credit risk.
<b>BBB (Moderate Safety)</b>	Instruments with this rating are considered to have moderate degree of safety regarding timely servicing of financial obligations. Such instruments carry moderate credit risk
<b>BB (Moderate Risk)</b>	Instruments with this rating are considered to have moderate risk of default regarding timely servicing of financial obligations
<b>B (High Risk)</b>	Instruments with this rating are considered to have high risk of default regarding timely servicing of financial obligations
<b>C (Very High Risk)</b>	Instruments with this rating are considered to have very high risk of default regarding timely servicing of financial obligations
<b>D (Default)</b>	Instruments with this rating are in default or are expected to be in default soon.
<b>A1</b>	Instruments with this rating are considered to have very strong degree of safety regarding timely payment of financial obligations. Such instruments carry lowest credit risk

<b>A2</b>	Instruments with this rating are considered to have strong degree of safety regarding timely payment of financial obligations. Such instruments carry low credit risk
<b>A3</b>	Instruments with this rating are considered to have moderate degree of safety regarding timely payment of financial obligations. Such instruments carry higher credit risk as compared to instruments rated in the two higher categories
<b>A4</b>	Instruments with this rating are considered to have minimal degree of safety regarding timely payment of financial obligations. Such instruments carry very high credit risk and are susceptible to default
<b>D</b>	Instruments with this rating are in default or expected to be in default on maturity.

Additionally, the rating agencies may apply '+' (plus) or '-' (minus) signs for ratings from AA to C to reflect the comparative standing within the company

The rating agency may also assign **outlooks** for ratings from AAA to B. Ratings on **rating watch** will not carry outlooks. A rating outlook indicates the direction in which a rating may move over the medium term horizon on one to two years. A rating outlook can be '**Positive**', '**Stable**' or '**Negative**'. A positive or negative rating outlook is not necessarily a precursor of a rating change.

## Section III : Credit Risk Mitigation

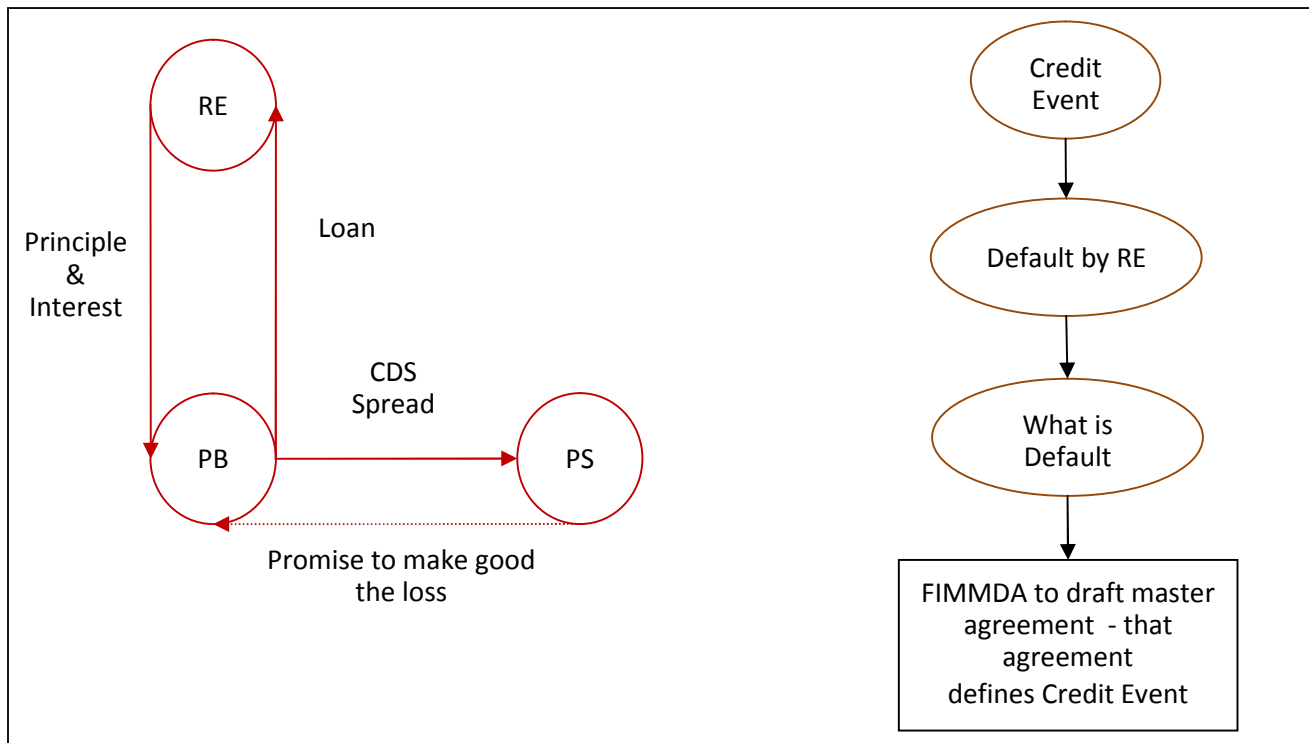
### How does the bank manage credit risk i.e., control credit risk?

- a. **Diversification** : Do not concentrate on a single borrower, geography, sector etc.
- b. **Credit Standardization** : Do not grant credit to customers whose credit worthiness is questionable ( Even section 1,2,3,4 and 6 of ICAI mat. deal with this)
- c. **Netting** : If at the time of default, exposure amount is 50 lakh with a collateral of 10 lakh, the net exposure would be 40 lakh only.
- d. **Collateral**: Cash collateral preferred - adequate hair-cut in case of non-cash collateral - check the legal and liquidity aspect of the collateral.
- e. **Covenants** : This refers to the terms and conditions imposed in the loan agreement -
  - **Affirmative Covenants** : what the borrower is supposed to do
  - **Negative Covenants**: what the borrower is not allowed to do.
- f. **Margin required** : Borrower has to furnish margin initially as well as additional margin if some covenant is violated.
- g. **Tightening** : Reducing the loan tenure, reducing loan amount etc., if credit conditions of the client worsens.
- h. **Loan Pricing** : Charging a higher rate to customers with low credit rating.
- i. **Credit Insurance** : Bank may buy insurance against default by customer. This is specially popular in case of export sales.
- j. **Credit Derivatives** (such as **Credit Default Swap(CDS)**) : A credit derivative is a financial contract which derives its value from the credit worthiness of a reference entity. The most popular credit derivatives is CDS (Credit Default Swap)

### In a CDS , there are 3 parties



The protection buyer will pay periodic CDS premium i.e., CDS spread to the protection seller. In case the reference entity defaults (legal definition of default provided by fixed income money market dealers association i.e., FIMMDA), protection seller will indemnify the protection buyer.



## Credit event

Default by the reference entity is called credit event. It comprises bankruptcy, failure to pay, obligation acceleration, repudiation, and moratorium. More specifically, this is defined in the master agreement by **international swaps and dealers association (ISDA)**. In India, it is done by FIMMDA.

## Settlement of CDS

### Case I : Physical Settlement

If credit event occurs i.e., reference entity defaults, protection buyer will deliver the bond to protection seller and receive face value of the bond.

### Case II : Cash settlement

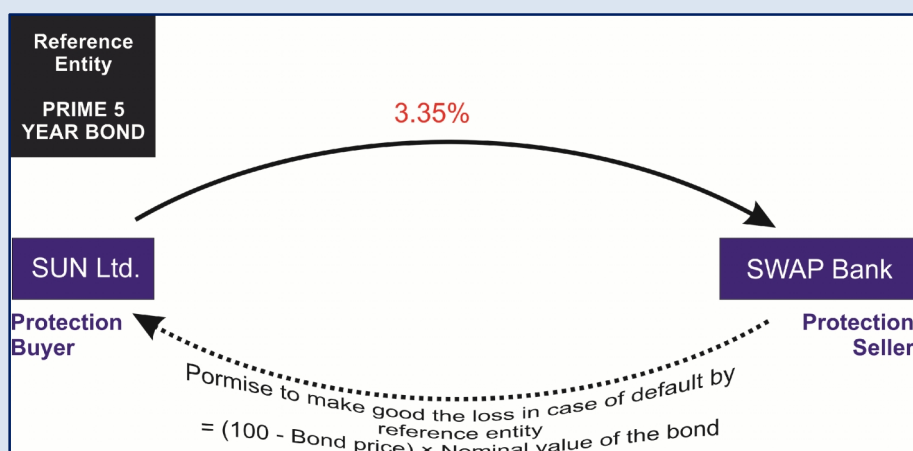
If credit event occurs i.e., reference entity defaults, Protection buyer will receive the difference between face value and market price of the CDS.

### Case III : Auction

If credit event occurs i.e., reference entity defaults, there will be an auction conducted in which bidders will bid for the defaulted bond. An average of the best bids will be taken as the market price. Then Protection buyer will receive the difference between face value and market price of the CDS.

### Example : Picked up from Nov 20 Case Study no. 2

Sun Ltd. has robust treasury desk and huge exposure to AA and BB rated debt. To hedge against the default risk of 10 year BB rated debt, it buys a 5 year CDS at a Swap premium of 3.35%.



Assuming now that during the life of the swap, there is a technical default on the Prime 5-year bond, such that its price now stands at 58. Under the terms of the swap, the protection buyer delivers the bond to the seller who pays to the protection buyer INR

- A. INR 4.2 million
- B. INR 42 million
- C. INR 5 million
- D. INR 4 million

**Answer : A is correct.**

**Explanation :**

**The protection seller will pay the loss suffered by the protection buyer =  $(100-58)\%$  of 10m = 4.2m**

### Sanjay Sir's Comment :

*This is an incorrect questions because we know that in CDS there are two type of settlement*

1. Cash Settlement
2. Physical Settlement .

*In case of Cash Settlement the protection buyer does not deliver the bond. He keeps the bond with himself and claims the loss amount from the protection seller. In this case 10 million was the face value of bond and the price has fallen to 58%. So, accordingly the loss is 42% . So, 42% of 10 million is 4.2 million and therefore **option A** has to be ticked as the right answer but that is wrong because the question is saying that the protection by delivers the bond to the seller. If the protection buyer is delivering the bond to the seller in that case he should get the entire 10 million. The entire 10 million option should have say 10 million that goes to show the degree of depth of the CA institute when it*



comes to setting questions and when I used the word "chomu" to refer to this lack of depth then student say that sir was saying "dekho CA Institute chomu hai". Please understand that either I will keep my bond and get the loss amount which is 4.2 million or deliver the bond and take the entire 10 million. So, the answer should have been 10 million given the language of the question.

One of the major Strategic risk faced by SUN is that of obsolete technology. It started with new technology when it was founded in 2002- perhaps the reason for its initial success. But not upgrading tech in today's fast moving dynamic business/industry environment is a key component.

We had done CDS in excruciating details in our classroom. Future examinations may throw up questions testing such details. Average performance would have been good.

It is surprising that certain students had messaged me that some YouTuber told them that CDS is not a part of RM but is a part of SFM. This is sheer stupidity and CA Final Students have to be matured enough to allocate the most precious resource on this universe i.e. time into positive NPV content.

## Difference between CDS and Credit Insurance

CDS	Credit Insurance
1. Doctrine of utmost good faith not applicable.	1. Doctrine of utmost good faith applicable.
2. Can be used for both speculation and hedging.	2. Can be used only for hedging
3. Protection buyer need not have insurable interest	3. Insurance buyer got to have insurable interest
4. It is marked to market resulting in income statement and balance sheet volatility	4. No mark to market
5. To cancel the contract, CDS can be squared off	5. Cannot be squared off
6. Anybody can sell CDS and become a protection seller	6. Only eligible insurance companies can sell insurance
7. No reserve requirements imposed on the protection seller	7. reserve requirements imposed on the insurance company.

## Guidelines of RBI on CDS (Taken from ICAI mat)

- Participants in the CDS market are classified as either users or market makers. User entities are permitted to buy credit protection (buy CDS contracts) only to hedge their underlying credit risk on corporate bonds. Such entities are not permitted to hold credit protection without having eligible underlying as a hedged item. The users cannot buy CDS for amounts higher than the face value of corporate bonds. This is the most important point of difference, as there was no such limitation in United States of America prior to 2008, and hence many Institutional players had taken huge long positions (in CDS) without having any exposure to reference asset.
- Since the users are envisaged to use the CDS only for hedging their credit risks, assumed due to their investment in corporate bonds, they shall not, at any point of time, maintain naked CDS protection i.e. CDS purchase position without having an eligible underlying bonds held by them and for periods longer than the tenor of corporate bonds held by them.
- The eligible entities under user's category would be Commercial Banks, PDs, NBFCs, Mutual Funds, Insurance Companies, Housing Finance Companies, Provident Funds, Listed Corporates, Foreign Institutional Investors (FIIs) and any other institution specifically permitted by the Reserve Bank of India.
- CDS will be allowed only on listed corporate bonds as reference obligations. However, CDS can also be written on unlisted but rated bonds of infrastructure companies. This is another major area of difference between the US markets and RBI guidelines. In United States of America, the CDS were written on various pass through securities like Mortgage Backed Security (MBS), Collateralized Debt Obligation (CDO) etc, whereas as per the RBI guidelines, the CDS are specifically restricted for listed corporate bonds, the obvious reason being that there is no big market of pass through securities in India as it is in US.
- The credit events specified in the CDS contract may cover: Bankruptcy, Failure to pay, Repudiation/moratorium, Obligation acceleration, Obligation default, Restructuring approved under Board for Industrial and Financial Reconstruction (BIFR) and Corporate Debt Restructuring (CDR) mechanism and corporate bond restructuring.
- Since, CDS are traded mainly over-the-counter (OTC), the contracting parties therefore have to agree upon the terms and conditions of the CDS individually. In order to facilitate documentation, and to avoid disputes as to whether a credit event had actually occurred and how a contract should best be settled, CDS contracting parties (in the international and US market) generally refer to the International Swaps and Derivatives Association (ISDA) Master Agreement. In India, the RBI guidelines specifically states that Fixed Income Money Market and Derivatives Association of India (FIMMDA) shall devise a Master Agreement for Indian CDS
- Regarding the Settlement procedures, the RBI Guideline states that the parties to the CDS transaction shall determine upfront, the procedure and method of settlement (cash/physical/auction) to be followed in the event of occurrence of a credit event and document the same in the CDS documentation. However it further adds that for transactions involving users, physical settlement is mandatory. For all other transactions, market-makers have been permitted to opt for any of the three settlement methods (physical, cash and auction), provided the CDS documentation envisages such settlement

- Further, the guidelines specifically provide norms for Prevention of mis-selling and market abuse, wherein it requires protection sellers to ensure that CDS transactions shall be undertaken only on obtaining from the counterparty, a copy of a resolution passed by their Board of Directors, authorizing the counterparty to transact in CDS.
- RBI has also incorporated certain reporting requirements in the guidelines which would require market makers to report their CDS trades with both users and other market makers on the reporting platform of CDS trade repository within 30 minutes from the deal time. The users would be required to affirm or reject their trade already reported by the market-maker by the end of the day. In addition to these reporting requirements the participants are also required to report to respective regulators (e.g. IRDA for Insurance companies) information as required by them such as risk positions of the participants vis-à-vis their net worth and adherence to risk limits, etc.