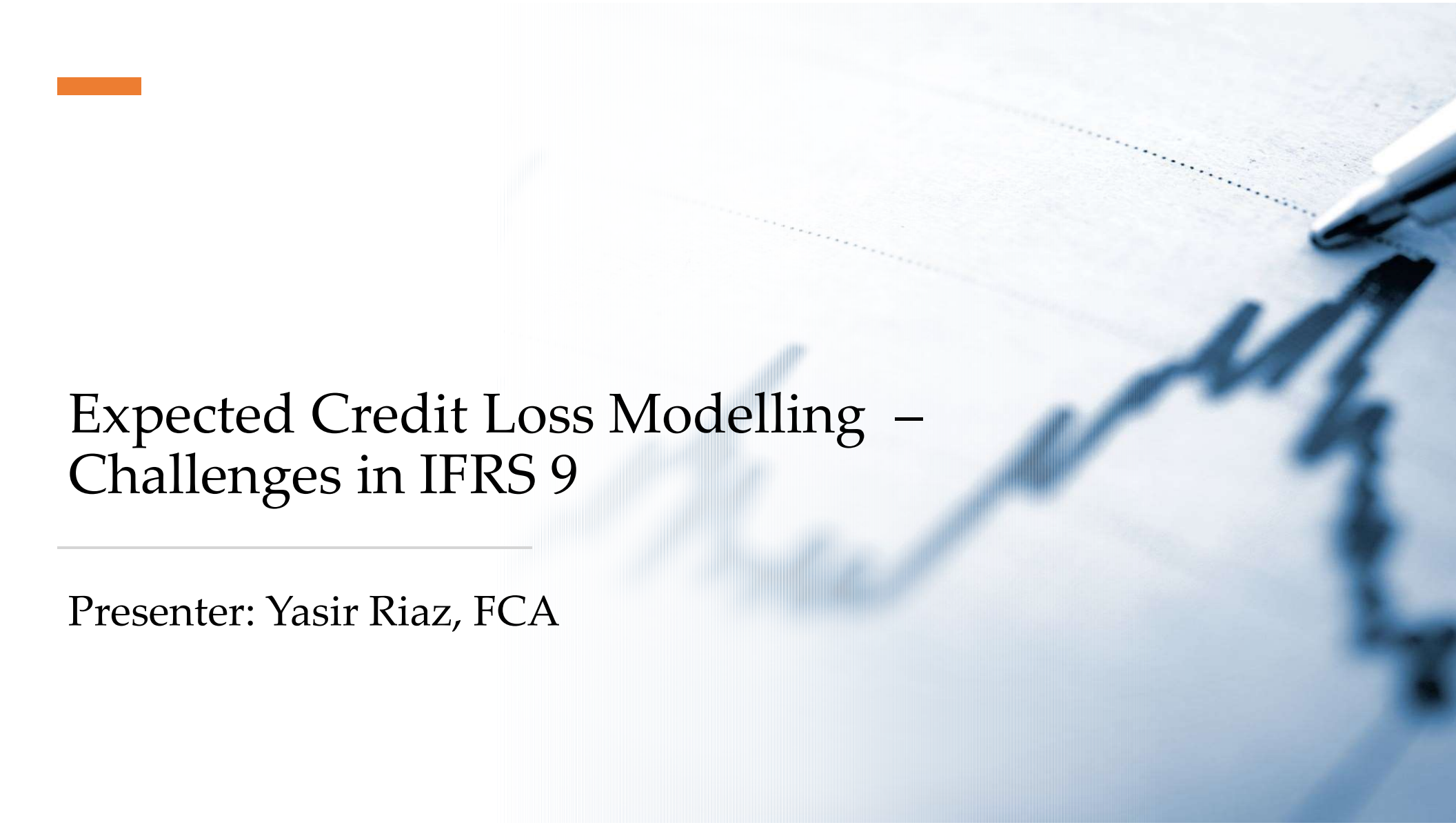


Expected Credit Loss Modelling – Challenges in IFRS 9

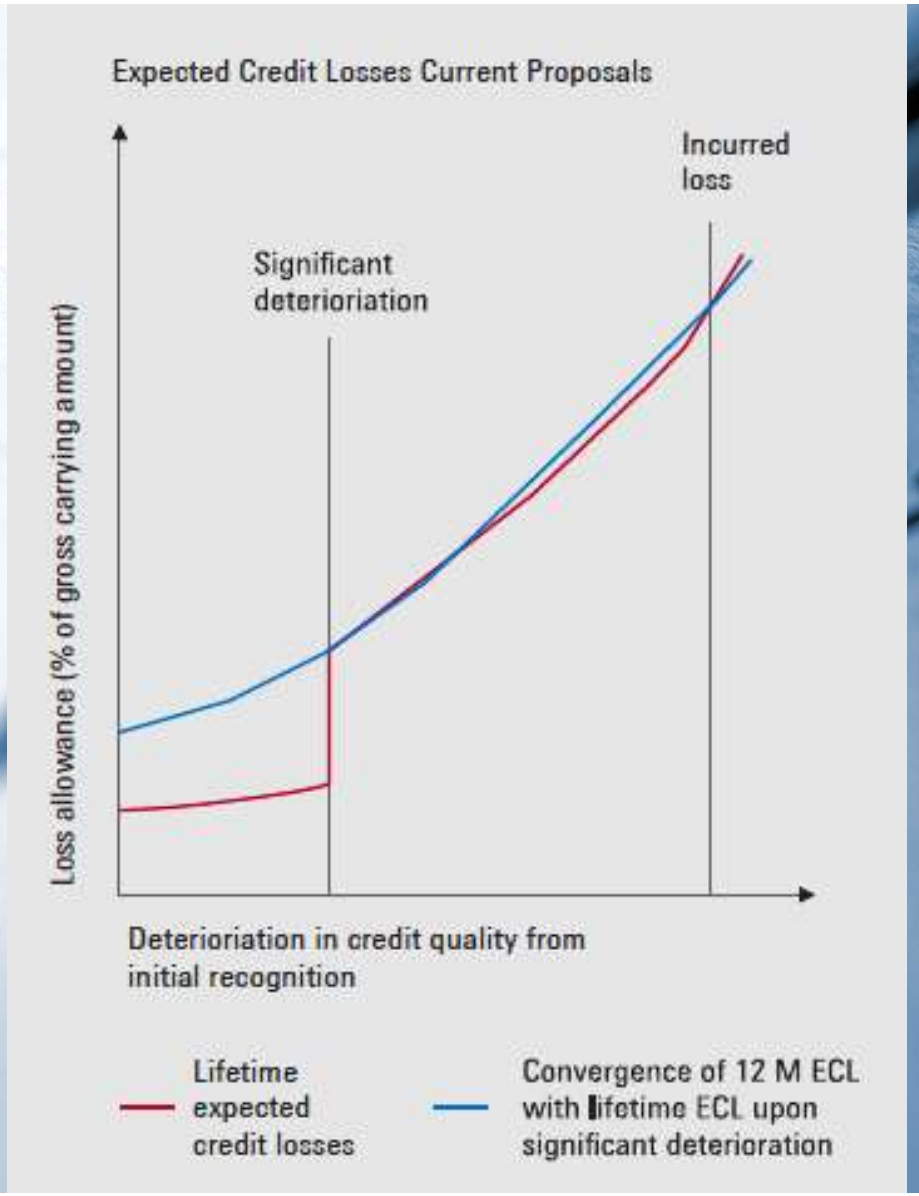
Presenter: Yasir Riaz, FCA

Contents

Introduction to ECL

IAS 39 incurred loss model was criticized for delaying in recognition of loss due to its complexity and different approaches. Under IFRS 9 replace this approach with Expected Credit Loss in which no need to wait for the loss event to occur and loss is recognized.

Incurred loss model (IAS 39) Vs Expected Credit Loss (IFRS 9)



Definitions

- **Gross carrying amount** – The amortised cost of a Financial Asset (FA), before adjusting for any loss allowance.
- **Amortised cost of a Financial Asset** – The amount at which the financial asset is measured at initial recognition minus the principal repayments, plus or minus the cumulative amortisation using the effective interest method
- **Past due** – A FA is past due when a counterparty has failed to make a payment when that payment was contractually due
- **Credit impaired FA** – is considered when:
  - Financial difficulty of the borrower or issuer
  - Breach of contract i.e. default or past due event
  - Economic conditions caused lender to give concession to borrower
  - There is chance of bankruptcy of the borrower
  - Active market disappear of FA
  - Purchase or origination of FA at deep discount

Definitions

- **Credit loss** – is cash shortfalls between cash flow that are due and cash flows expected to be received

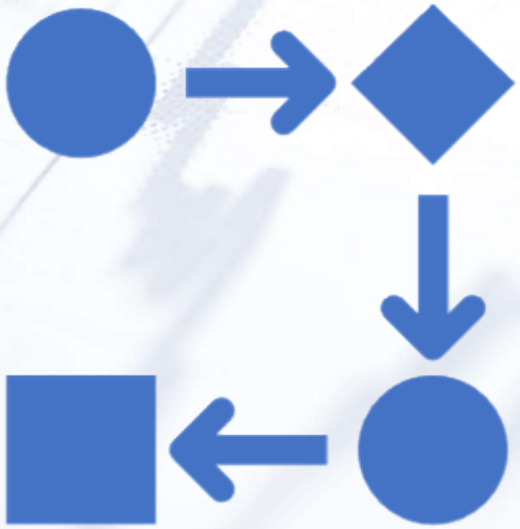
  Credit loss = PV of contractual cash flows – PV of expected cash flows

- **Expected credit losses** – The weighted average of credit losses with the respective risks of a default occurring as the weights.
- **12-M ECL** – The default events that are possible within the 12 months after the reporting date.
- **Lifetime expected credit losses** – The ECL that result from all possible default events over the expected life of a financial instrument.
- **Loss allowance** – The allowance for expected credit losses on financial assets measured lease receivables, contract assets, loan commitments and financial guarantee contracts.

Scope of ECL

- The ECL model **applies to:**
  - **debt instruments** (such as bank deposits, loans, debt securities and trade receivables) recorded **at amortised cost or at fair value through other comprehensive income,** lease receivables and contract assets.
  - Loan commitments; and financial guarantee **contracts that are not measured at fair value through profit or loss (Off balance sheet).**

- ECL model is **not applicable to**:
  - **Equity instrument**
  - Loan commitments; and financial guarantee **contracts that are measured at fair value through profit or loss.**



Recognition of ECL

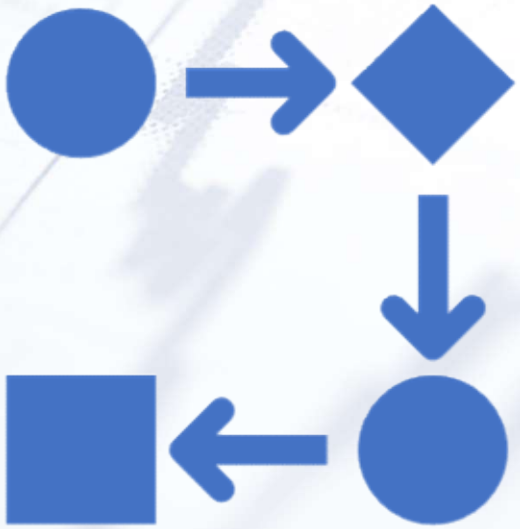
IFRS 9 **categorizes the impairment losses** to be measured and calculated on the basis of:

- **General Approach**
- **Simplified Approach**

IFRS 9 does not provide any specifications on the design of the model.

Principle Assumptions

- The guiding principle of the ECL model is to reflect the **general pattern of deterioration, or improvement, in the credit quality of financial instruments**.
- ECL model is based on **internal historical credit loss experience**, internal ageing summary of the debt instruments, internal / external rating, **macro-economic factors** such as interest rates, rate of inflation, unemployment and GDP growth rate.

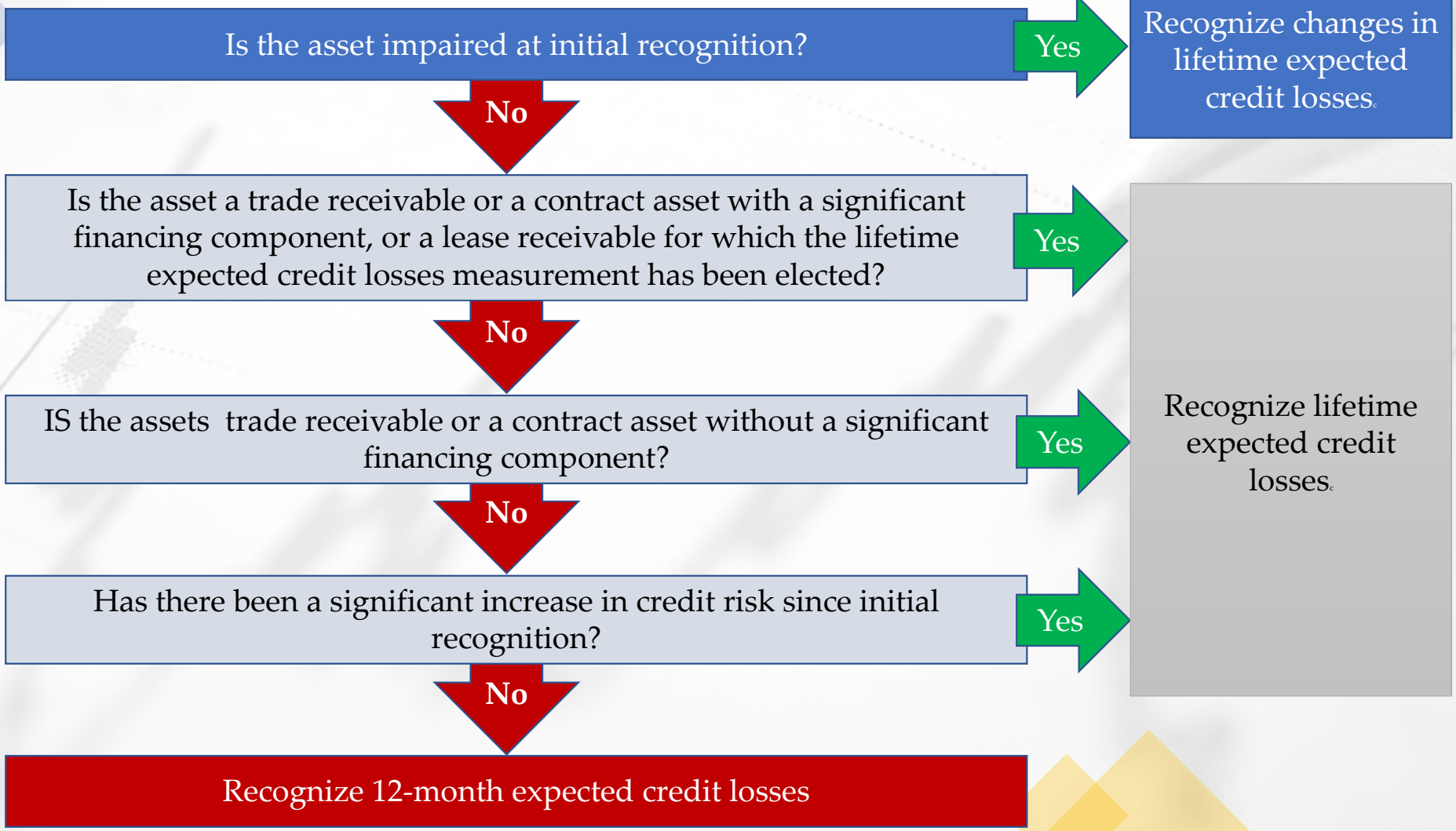


Recognition of ECL

Key factors to consider:

- The management of the company must represent that the **business activities have been carried out in the normal and ordinary course of business** and at the reporting date, no material change has occurred in the operations and financial position till the reporting date.
- The working of this nature is necessarily **based on the financial, economic and other conditions in general and industry trends** as in effect on, and the information made available as of the reporting date.
- **There will always be several factors**, e.g. management capability, present and prospective change in factors including but not restricted to inflation, government policies, unemployment rate and interest rate etc. **which are not evident from the summary of financial information** but which will strongly influence the calculation of ECL.

Recognition of ECL



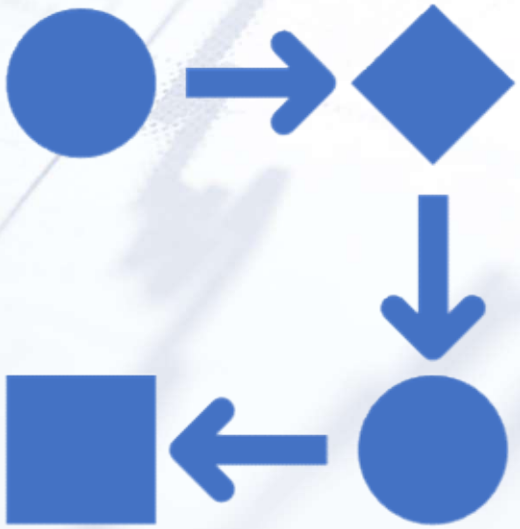
Measurement of ECL

ECL shall be measured on all FA using either Collective or Individual Assessment

Individual assessment = Assessment of 1 financial asset

Collective assessment = Assessment of group or sub-group of financial assets

- When there is not enough information to assess individually (e.g. retail loans)
- Grouping based on shared credit risk characteristics
  - ✓ Instrument type
  - ✓ Credit risk rating
  - ✓ Industry
  - ✓ Collateral type
  - ✓ Geographical location



Measurement of ECL

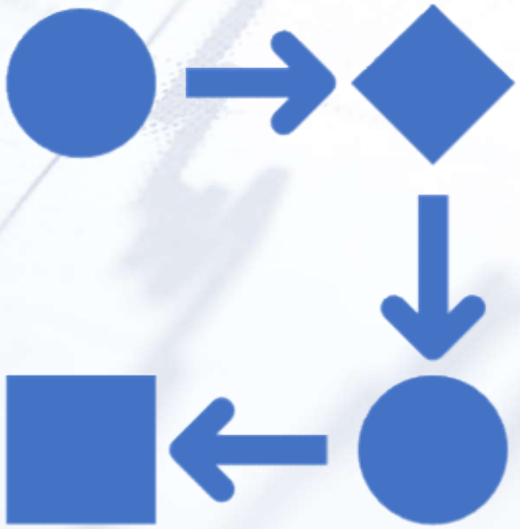
ECL on FA is an unbiased probability weighted amount based out of possible outcome after considering the risk of credit loss even probability is low.

The ECL Formula can be as follows:

$$ECL = \sum_{t=1}^{T} MPD_t * LGD_t * EAD_t * D_t$$

Hence the 12 month ECL or lifetime is calculated based on following components:

- Marginal Probability of Default (MPD)
- Loss given default (LGD)
- Exposure at default (EAD)
- Discount Factor (D)



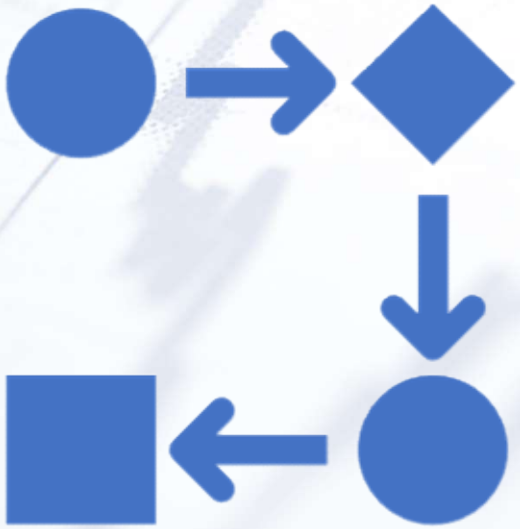
Measurement of ECL

Loss Given Default: LGD is an estimate of the loss from a transaction given that default occurs. Following are the methodologies to calculate LGD:

- Workout LGD (loss of principal and carrying costs of NPL (interest income foregone, collection and legal charges) discounted original EIR divided by Defaulted Exposure.
- Market LGD
- Asset Pricing Model
- Market-based Model

Exposure at Default (EAD) - is the predicted amount of loss an issuer may face in the event of, and at the time of, the borrower's default.

Time value of Money – the expected credit losses shall be discounted using the original effective interest rate in order to arrive at the present value of expected losses at the reporting date.



Measurement of ECL

Loss Given Default: LGD is an estimate of the loss from a transaction given that default occurs. Following are the methodologies to calculate LDG:

- **Workout LGD (loss of principal and carrying costs of NPL (interest income foregone, collection and legal charges) discounted original EIR divided by Defaulted Exposure.**
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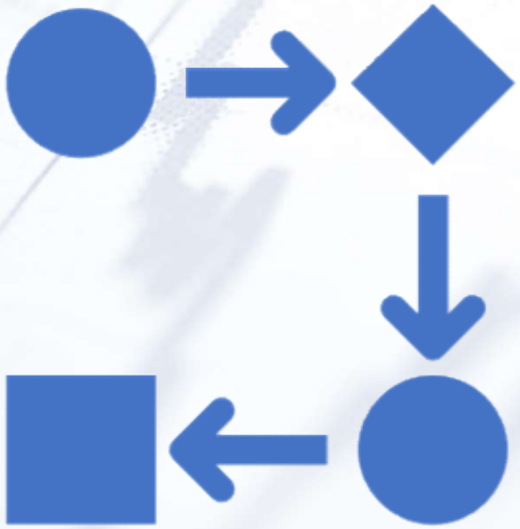


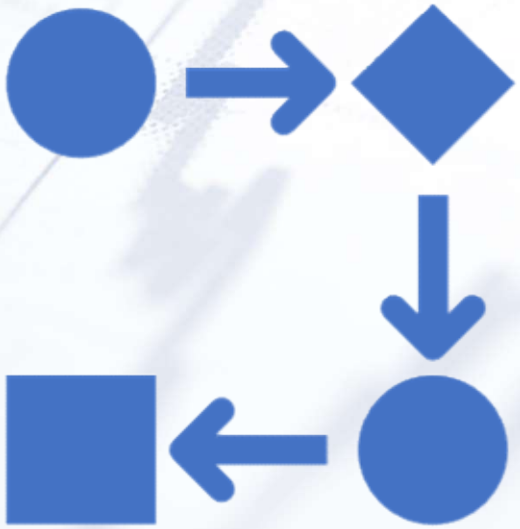
Measurement of ECL

Probability of Default: PD is probability of whether the borrower will default on their obligations in future.

The following list of methodologies can be used to generate forwarded looking PD term structure:

- Markov Chain Model
- Parametric Survival Regression (Weibull Model)
- Vasicek single factor model
- Forward intensity model on distance-to-default approach
- Pluto Tasche PD Model

We will be using Markov Chain Model for calculation of PD in this presentation, PD term structure requires plotting of transaction matrices till the lifetime of the asset.



Measurement of ECL

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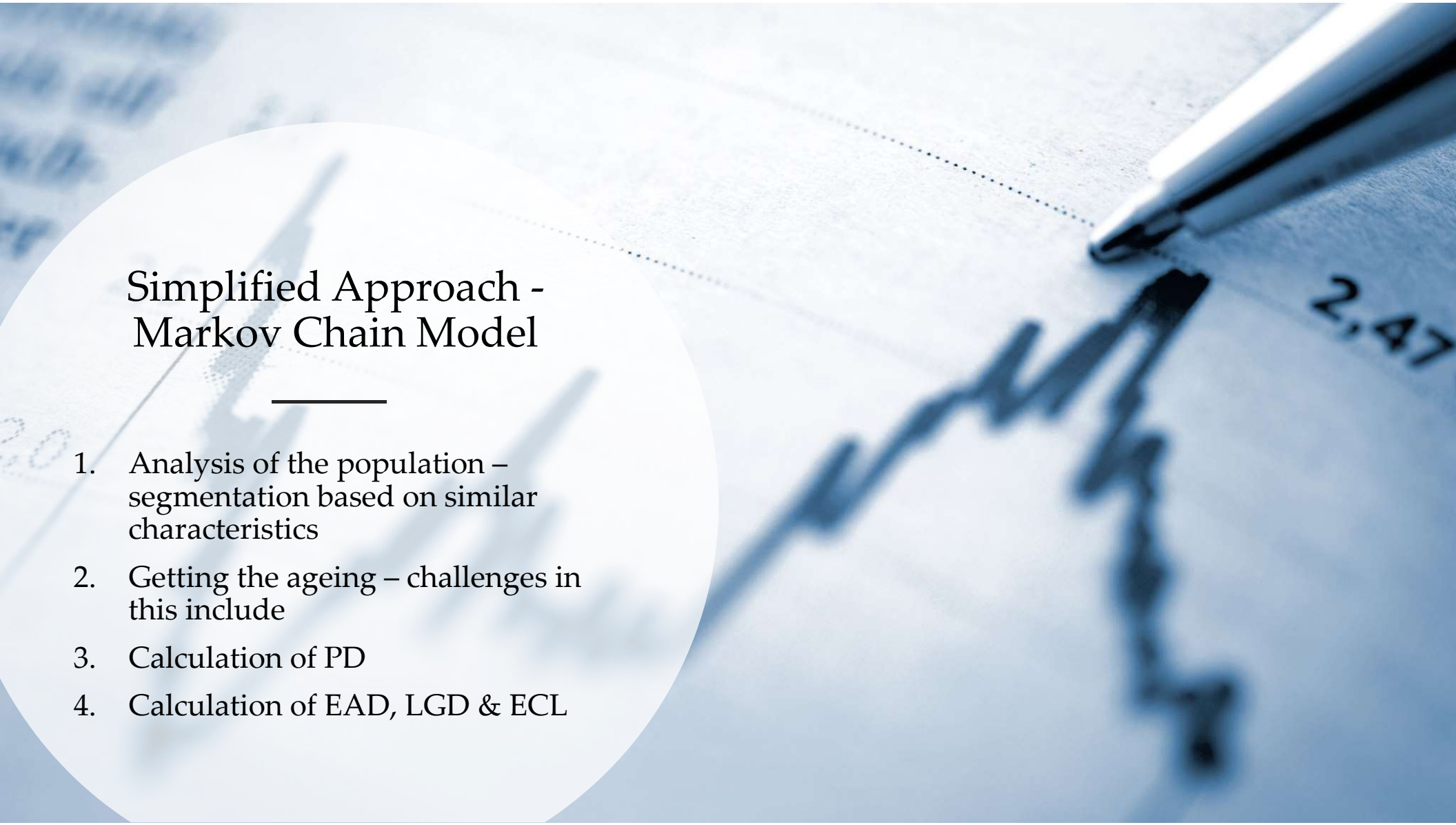


Simplified Approach - Markov Chain Model

1. Analysis of the population – segmentation based on similar characteristics
2. Getting the ageing – challenges in this include
3. Calculation of PD
4. Calculation of EAD, LGD & ECL

Step 1: Analysis of the population – segmentation based on similar characteristics

- instrument type
- credit risk ratings
- collateral type (secured or unsecured)
- date of initial recognition
- industry
- geographical locations (local or foreign)
- type of product
- nature of customer (Govt. or Others)
- type of credit terms

Step 2: Getting the ageing – challenges in this include:

- Usually clients don't have system for getting ageing report
- Age bucket selection
- No proper application of recoveries against outstanding balance
- Age bucket balances are haphazard due to adjustments of credit and debit notes
- Ageing of minimum last two years is required sometime past data is not available

How to manage this problem?

Step 2: Getting the ageing – challenges in this include:

How to manage this problem?

- Ask client to prepare ageing manually using Invoice wise data
- Perform control testing over data prepared by management (Completeness and Accuracy of aging)
- If ageing is extracted from system then plan to perform procedures over application controls
- Perform data cleansing
- Reconcile the figures with FS

Step 3: Calculation of PD

3.1 **Calculation of Roll Rate** – in this step we calculate the balance move to next bracket of ageing to identify the recoveries from one age bucket to next age bucket. (Refer Table 3.1 and 3.2 in Excel Sheet)

Step 3: Calculation of PD – Table 3.1 (Age Buckets)

Age Bucket	Not yet due	1 to 90	91 to 180	181 to 270	271 to 360	>360
Q1 (2020)	1500	1600	1000	600	500	500
Q2 (2020)	900	1000	1400	800	500	1000
Q3 (2020)	400	600	800	1200	600	1500
Q4 (2020)	1000	200	400	600	1000	2100
Q1 (2021)	1400	900	190	350	100	3100
Q2 (2021)	2000	1000	700	180	200	3200
Q3 (2021)	1500	1800	600	500	160	3400
Q4 (2021)	1200	700	1600	200	300	3560

Step 3: Calculation of PD – Table 3.1 (Age Buckets)

Age Bucket	Not yet due	1 to 90	91 to 180	181 to 270	271 to 360	>360
Q1 (2020)	1500	1600	1000	600	500	500
Q2 (2020)	900	1000	1400	800	500	1000
Q3 (2020)	400	600	800	1200	600	1500
Q4 (2020)	1000	200	400	600	1000	2100
Q1 (2021)	1400	900	190	350	100	3100
Q2 (2021)	2000	1000	700	180	200	3200
Q3 (2021)	1500	1800	600	500	160	3400
Q4 (2021)	1200	700	1600	200	300	3560

Roll rate calculation for Table 3.2:
1000/1500 = 67%

Step 3: Calculation of PD – Table 3.2 (Calculation of Roll rate)

Age Bucket	Not yet due	1 to 90	91 to 180	181 to 270	271 to 360	>360
Q1 (2020)						
Q2 (2020)		67%	88%	80%	83%	100%
Q3 (2020)		67%	80%	86%	75%	100%
Q4 (2020)		50%	67%	75%	83%	100%
Q1 (2021)		90%	95%	88%	17%	100%
Q2 (2021)		71%	78%	95%	57%	100%
Q3 (2021)		90%	60%	71%	89%	100%
Q4 (2021)		47%	89%	33%	60%	100%

Loss rate calculation for Table 3.3:
Product of the above selected cell
67% x 80% x 75% x 17% x 100% = 7%

Step 3: Calculation of PD

3.1 **Calculation of Roll Rate** – in this step we calculate the balance move to next bracket of ageing to identify the recoveries from one age bucket to next age bucket. (Refer Table 3.1 and 3.2 in Excel Sheet)

3.2 **Calculation of Loss Rate** – is product of roll rate over the life of an asset (Refer Table 3.3 in Excel Sheet)

Step 3: Calculation of PD – Table 3.3 (Calculation of Loss rate)

Hostorical Loss Rate					
Not yet due	**1 to 90**	**91 to 180**	**181 to 270**	**271 to 360**	**>360**
0%	7%	63%	60%	83%	100%
0%	22%	10%	71%	75%	100%
0%	40%	33%	13%	83%	100%
0%	30%	80%	50%	17%	100%
0%	**25%**	**46%**	**48%**	**65%**	**100%**

Step 3: Calculation of PD – Table 3.3 (Calculation of Loss rate)

Hostorical Loss Rate					
Not yet due	**1 to 90**	**91 to 180**	**181 to 270**	**271 to 360**	**>360**
0%	7%	63%	60%	83%	100%
0%	22%	10%	71%	75%	100%
0%	40%	33%	13%	83%	100%
0%	30%	80%	50%	17%	100%
0%	**25%**	**46%**	**48%**	**65%**	**100%**

Average of Loss rate
Average of the above selected cells:
(7% + 22% + 40% + 30%) / 4 = 25%

Step 3: Calculation of PD

3.3 **Take impact of MEV's** (Macro Economic Variables) – Refer Table 3.4 and 3.5

- Use general MEV like GDP, unemployment rate, interest rate, inflation etc.
- The current MEV and forecasted MEV are considered to calculate a factor for each respective MEV.
- The ratio is calculated as current MEV/ Forecasted MEV for favourable MEV like GDP while the ratio for unfavourable MEV is calculated as Forecasted MEV / current MEV for example unemployment.
- Assign weights to each MEV. The total for all weights must be equal to 1.

Step 3: Calculation of PD – Table 3.4 (Macro Economic Factors)

Macro-economic factors as on June 30, 2021	Current MEV	Forecasted MEV	Ratio (for fav. A/B and for unfav. B/A)	Weight Must be equal to 1	Factors
	A	*B*	*C*	*D*	*E = C * D*
GDP	278.22	310.00	0.90	0.25	0.22
Unemployment	4.10	6.00	1.46	0.25	0.37
Interest rate	7.00	7.00	1.00	0.25	0.25
Inflation	8.70	7.50	0.86	0.25	0.22
				1.00	**1.06**

Step 3: Calculation of PD – Table 3.5 (PD Adjustment for MEVs)

Age Bucket	Historical Loss Rate (Table 3.3)	Forward Looking Factors (Table 3.4)	PD adjsuted with MEV
Not yet due	0%	106%	0%
1 to 90	25%	106%	26%
91 to 180	46%	106%	49%
181 to 270	48%	106%	51%
271 to 360	65%	106%	68%
>360	100%	100%	100%

Step 4: Calculation of EAD, LGD & ECL – Simplified Approach

$$ECL = \sum_{t=1}^{T} MPD_t * LGD_t * EAD_t * D_t$$

Age Bucket	EAD	Collateral held	LGD	PD (Table 3.5)	ECL
	A	*B*	*C = (A - B) / A*	*D*	*E = A x C x D*
Not yet due	1200	200	83%	0%	0
1 to 90	700	50	93%	26%	170
91 to 180	1600	0	100%	49%	785
181 to 270	200	0	100%	51%	102
271 to 360	300	0	100%	68%	205
>360	3560	1500	58%	100%	2060
Total	7560	1750			3321

General Approach

1. Analysis of the population – segmentation based on similar characteristics
2. Calculation of PD & LGD
3. Calculation of EAD & ECL

General Approach

Step 1 Analysis of the population – segmentation on basis of similar characters as discussed in previous slides shall remain same for General approach.

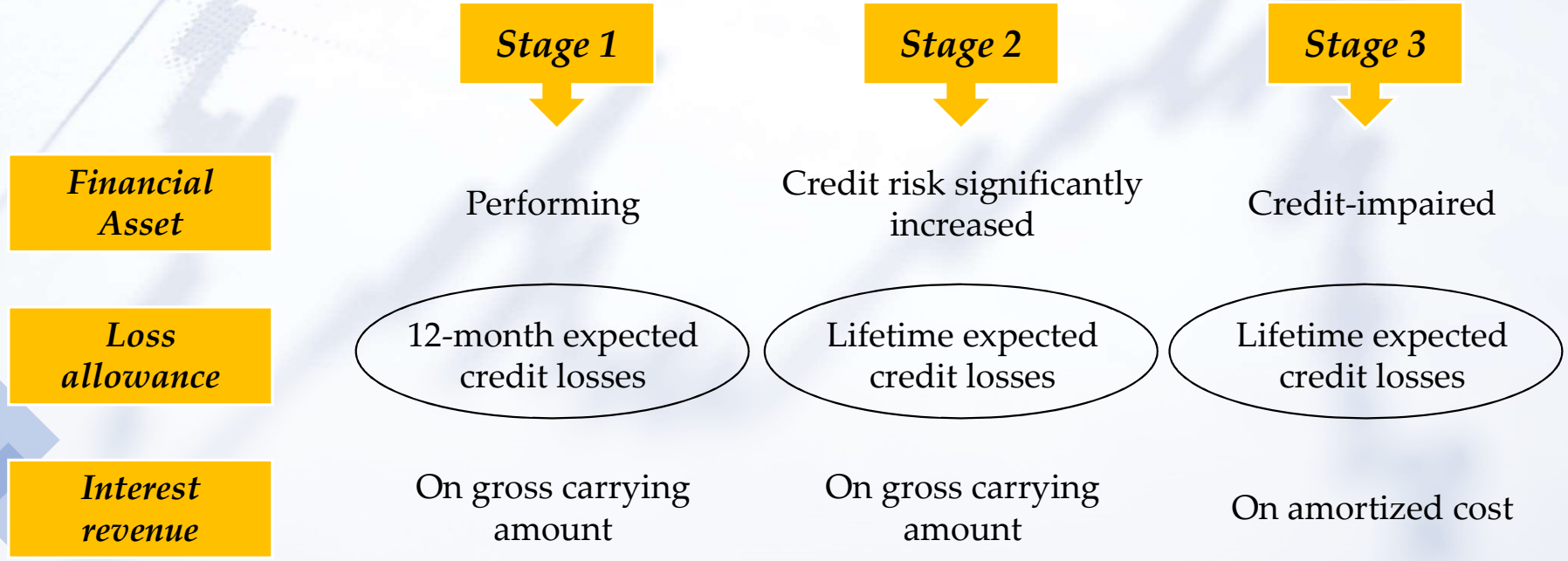
However, Calculation for PD, LGD shall change. Due to limited time, only related parties balances (other than those covered in Simplified Approach) are discussed here.

Loss Given Default for 12 month ECL shall be calculated using a Balance Sheet approach (Workout LGD) as mentioned in Table 4.1.

Probability of Default for 12 month ECL in this method is calculated on the basis of ratios and profitability factors as mentioned in Table 4.2.

General Approach – Staging of FA

- All financial assets are initially allocated to Stage 1.
- If the credit risk increases significantly, the FA is transferred to Stage 2.
- If there is an objective evidence of impairment of FA, the FA is transferred to Stage 3.



General Approach – Change in Credit Risk

Factors to consider for assessing changes in credit risk:

- significant **changes in internal price indicators** of credit risk as a result of a change in credit risk since inception
- **changes in the rates** or terms of an existing financial instrument
- **significant changes in external market indicators**
  - the credit spread;
  - the credit default swap prices for the borrower;
  - the length of time or the extent to which the fair value of a financial asset has been less than its amortised cost; and
  - other market information related to the borrower, such as changes in the price of a borrower's debt and equity instruments.
- an actual or expected s**ignificant change in the financial instrument's external credit rating**
- existing or forecast **adverse changes in business, financial or economic conditions** that are expected to cause a significant change in the borrower's ability to meet its debt obligations.

General Approach – Change in Credit Risk

Factors to consider for assessing changes in credit risk:

- significant **changes in the value of the collateral** supporting the obligation or in the quality of third-party guarantees or credit enhancements
- significant **change in the quality of the guarantee** provided by a shareholder (or an individual's parents) if the shareholder (or parents) have an incentive and financial ability to prevent default by capital or cash infusion.
- expected **changes in the loan documentation** including an expected breach of contract
- significant **changes in the expected performance** and behaviour of the borrower
- **past due information**, including the rebuttable presumption.

General Approach

Factors to consider for assessing changes in credit risk:

- Past due information, including the rebuttable presumption is that the credit risk on a financial asset has increased significantly since initial recognition when contractual payments are more than 30 days past due. The same will not be applicable, if the entity has reasonable and supportable information that the credit risk has not increased.
- However, the rebuttable presumption in paragraph 5.5.11 is not an absolute indicator that lifetime expected credit losses should be recognised.

Calculation of LGD (General Approach – Table 4.1:)

Particulars	Carrying value	Impairment % for NRV	Net Realizable Value
Assets			
Property, plant and equipment and CWIP	1,000,000	25%	750,000
Assets subject to finance lease	2,000,000	25%	1,500,000
Investment in Subsidiaries	1,500,000	0%	1,500,000
Long term advances and deposits	500,000	25%	375,000
Stock in trade	2,400,000	25%	1,800,000
Trade debts	2,200,000	3%	2,134,048
Other Assets and Prepayments	50,000	20%	40,000
Bank guarantee margin	10,000	20%	8,000
Short Term Investments	200,000	0%	200,000
Cash and bank balances	150,000	0%	150,000
Total assets	**10,010,000**		**8,457,048**
Assets at Realizable value			8,457,048
Liabilities			5,000,000
Net assets			3,457,048
Current Equity			4,500,000
Loss Given Default in Amount			1,042,952
Loss Given Default in Percentage			23.18%

Calculation of PD (General Approach – Table 4.2)

Criteria	Figures as per FS	Rating	Default Risk
Profitability			
2018	1,000,000	Strong	5%
2019	- 250,000	Weak	50%
2020	1,500,000	Strong	5%
2021	800,000	Very weak	100%
Current ratio	2.17	Very Strong	0%
Quick ratio - Acid Test ratio	1.94	Very Strong	0%
Return on Investment	4.31%	Good	20%
Secured liabilities	100,000	Average	35%
Probability of Default			**27%**

Calculation of ECL (General Approach – Table 4.3)

12-month expected credit loss				
Default within 12 months?	**PD**	**LGD**	**EAD**	**Credit loss (CU)**
Yes	27%	23%	15,000,000	934,312
No	73%	0%	15,000,000	-

Q & A Session

Thank You!