

# **GUIDANCE ON IFRS 9 IMPAIRMENT REQUIREMENTS FOR INSURERS**

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IFRS 9 Working Party

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# 1. Introduction

- 1.1. IFRS 9, *Financial Instruments*, is the International Accounting Standards Board (IASB)'s replacement to IAS 39, *Financial Instruments Recognition and Measurement*. IFRS 9 addresses the key areas of:

- Classification and measurement of financial instruments
- Impairment
- Hedge accounting

This guideline deals primarily with the area of impairment of financial instruments.

- 1.2. This guideline sets out the general principles for the consistent measurement (or valuation) of expected credit losses for insurance and reinsurance receivables under International Financial Reporting Standard (IFRS) 9 Financial Instruments whose effective implementation date is 1 January 2018. The guidance does allow insurance companies that will be applying IFRS 17, to defer adoption to 1 January 2021; however in practice most of the industry is adopting IFRS 9 for 1 January 2018.
- 1.3. This guideline shall focus on receivables that are unique to insurance and reinsurance companies that are licensed by the Insurance Regulatory Authority (IRA) to operate in the Republic of Kenya. This includes both life and general insurers.
- 1.4. The recommended practice in this guideline complies with the Impairment principles set out in IFRS 9 Financial Instruments i.e. an entity shall always measure the loss allowance at an amount equal to lifetime expected credit losses for trade receivables or contract assets that result from transactions that are within the scope of IFRS 15 that either do or do not contain a significant financing component.
- 1.5. The following are the types/classes of receivables (a non-exhaustive list) that may appear on the balance sheet of an insurer.
1. Insurance Receivables
  2. Reinsurance Receivables
  3. Investment Receivables
  4. Receivables from Related Parties
  5. Receivables from other operating activities
- 1.6. This guideline shall focus on the impairment treatment of Insurance and Reinsurance Receivables.

# 2. Definitions

- 2.1. **Insurance Receivables:** These shall include outstanding premium/fee income from policyholders/clients, outstanding commission/fee income and outstanding claims recoveries from co-insurance arrangements.
- 2.2. **Reinsurance Receivables:** These shall include outstanding claim recoveries from reinsurers (or retrocession) and outstanding reinsurance (or retrocession) commission income.

- 2.3. **Receivables from other operating activities:** These shall include receivables or recoveries from employees (e.g. salary advances), agents, intermediaries, suppliers and others.
- 2.4. **Investment Receivables:** These shall include income receivables from investment assets i.e. property, debt and equity instruments e.g. interest, coupons, dividends and rents that are outstanding and are past their due dates.
- 2.5. **Receivables from Related Parties:** These shall exclude long-term contractual loan obligations and shall only include short-term lines of credit offered to related companies to support short-term cash flow needs.
- 2.6. **Related Parties:** Shall be defined as a director (both executive and non-executive), parent company, sister company (i.e. another subsidiary of the parent company), subsidiary or participation (where the insurer owns at least 20% of the total shareholding) of the insurer. However it excludes the insurer's employees, who are not Executive Directors or a Principal Officer.
- 2.7. **Default:** Shall be deemed to have occurred when the outstanding amount receivable is more than 90 days overdue for insurers and 180 days for reinsurers (and retrocession).
- 2.8. **Credit Risk:** is defined as the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation.
- 2.9. All other terms/words not expressly defined in this guideline shall take the meaning as prescribed first by International Financial Reporting Standards (IFRS) and the International Accounting Standards Board (IASB).

### 3. Summary of IFRS 9 requirements

#### 3.1. What is in scope?

##### 3.1.1. Debt instruments

Impairment of debt instruments, in particular those held at amortised cost and at fair value through other comprehensive income (FVOCI)

##### 3.1.2. Loans and mortgages

Determining the considerations made in impairment of loans. These include policy loans, staff loans and mortgages

##### 3.1.3. Receivables

IFRS 9 impairment of receivables with special consideration on premium debtors.

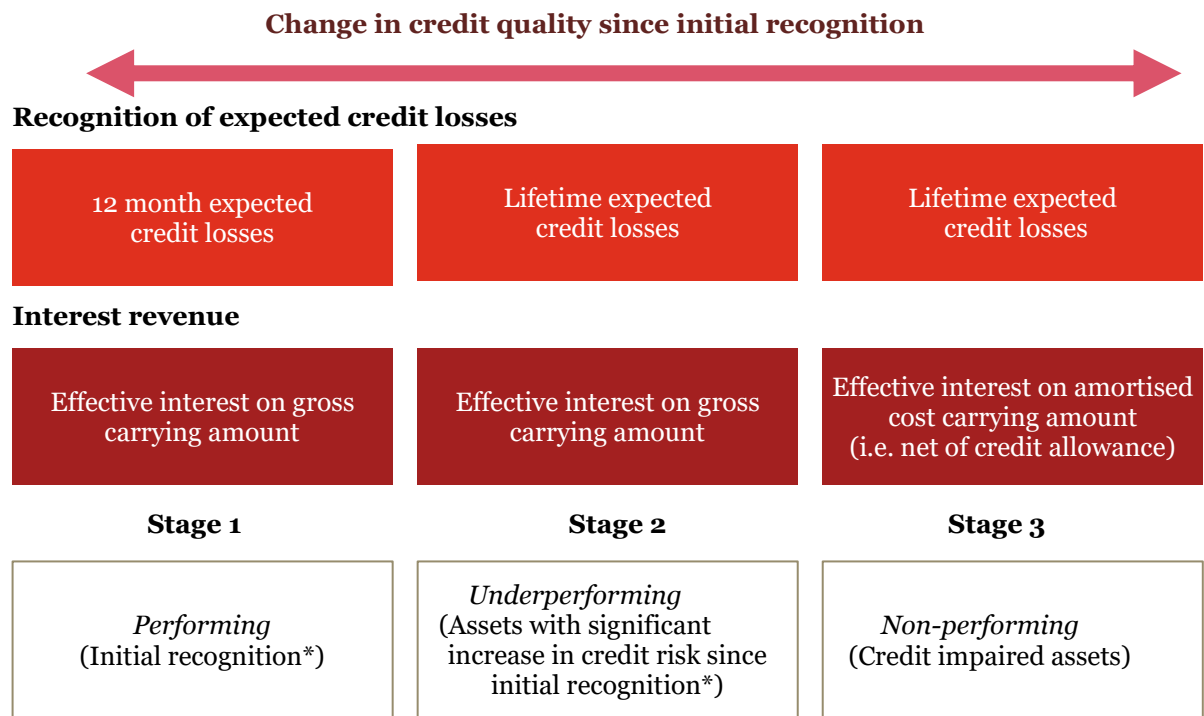
##### 3.1.4. Cash at bank

Treatment of bank balances and fixed deposits under IFRS 9

3.2. Expected Credit Losses under IFRS 9

3.2.1. The 3 stage general model

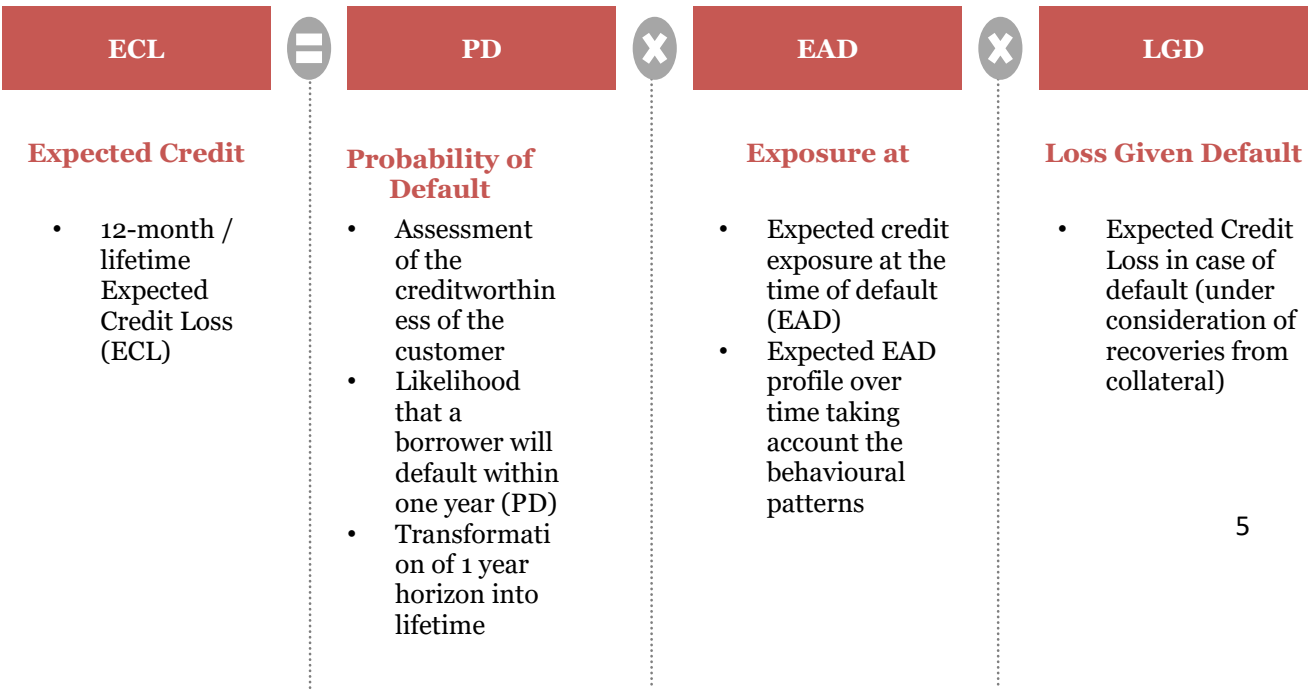
The standard outlines a three stage model for impairment based on changes in credit quality since initial recognition. These stages are as outlined below:



\*Except for purchased or originated credit impaired assets

3.3. Calculation of Expected Credit losses

Calculation of the expected credit loss is based on the key risk parameters of PD, LGD and EAD, according to the formula set out below:



The calculation of ECL should incorporate **forward-looking information** in all the ECL components. This forward-looking information will impact the various ECL components as follows:

- Probability of default – The PDs will vary during various stages of an economic cycle.
- Loss Given Default – Collateral values will vary based on the stage of an economic cycle.
- Exposure at default – Change in interest rates may affect the EAD e.g. higher interest rates may result in longer terms for loans causing a change in the EAD

Various indices can be used to assess the key factors that impact the institution's loss likelihood and severity. These include but are not limited to:

- GDP
- Inflation rate
- Unemployment rate
- Exchange rates
- Forex reserves
- Central Bank base lending rate

These can be sourced from the Kenya Bureau of Statistics, IMF and similar organisations.

Different scenarios should be applied in the ECL calculations. Each scenario should give different weights to the forward-looking information selected.

The recommended view when incorporating these elements in the calculation of the ECL is to use expert judgement to determine the indices to be used, the level to which these affect the ECL components and the likelihood of the different scenarios.

## 4. Rating framework

### 4.1. Development of a rating framework

- 4.1.1. The rating framework aims to give insurers guidance on the ratings to apply to their financial assets as well as the corresponding probability of default that will apply.
- 4.1.2. Over and above the proposed recommendations, insurers may use their own historical data and macroeconomic factors to determine default probabilities that are more suited to the nature of the financial assets that they hold, subject to prescribed minimum rates.
- 4.1.3. The rating framework applies principles from
  - 1. Local and international Best Practice on rating the various financial assets that are discussed in this document.
  - 2. Actuarial principles regarding PD and LGD estimations.
- 4.1.4. Rating framework factors

For each of the financial assets described below, a rating framework has been prescribed that takes into account the following factors:

- 1. Internal historical data: historical default probabilities
- 2. Client-specific information: cash-flow statements, company ratings, profitability
- 3. Macroeconomic information: GDP, Inflation, Unemployment Rates, Exchange Rates

A rating is applied to each financial asset, following which a corresponding default probability is prescribed.

4.2. “Rating”/risk scoring of bonds

4.2.1. “Creditworthiness” refers to whether a bond or other financial instrument will be paid according to its contractual terms. Rating of financial instruments seems to establish the creditworthiness of a particular bond.

In determining the rating of a bond, we recommend that the following factors should be considered and well documented:

Rating Factors	Quantitative measures	Qualitative measures
Debt-specific factors	<ul style="list-style-type: none"><li>• <b>Rating by independent rating agency</b> – if the issued security has been rated by a credible* rating agency, the strength of the debt instrument will be based on the debt rating relative to the rating of other similar debt issued by the company, the rating of the issuing company, the rating of similar companies and bonds, and the rating of the country in which the debt was issued. For treasury bonds, it is expected that this will be rated by credible rating agencies prior to issue.</li><li>• <b>Yield on corporate bonds</b> – it is expected that corporate bonds will be issued at a premium when compared to government bonds. This is to cover expected credit and illiquidity risks, and the commensurate risk premiums. The lower the bond yield, relative to government, the stronger the bond is expected to be.</li></ul>	<p>The “cannons of lending” should be considered when determining the strength of the debt. This includes:</p> <ul style="list-style-type: none"><li>• <b>Purpose of the debt</b> – if the purpose of raising the debt is in line with the company’s objectives and industry reasonable expectations, and whether the sources of repayment are clear and reasonable;</li><li>• <b>Amount of the debt</b> – relative to the project being financed and the net assets of the borrower;</li><li>• <b>Ranking of debt</b> – relative to other debt issued by the borrower as well as other creditors in the event of a solvency; and</li><li>• <b>Guarantee from a higher rated guarantor</b> – the stand-alone creditworthiness of an issuer or issued security can be improved by obtaining this guarantee, provided it can be demonstrated to meet the underlying obligations in the event an expected or foreseeable event occurs.</li></ul>



<b>Company-specific factors</b>	<ul style="list-style-type: none"> <li>• <b>Rating by independent rating agency</b> – similar to rating of an issued security, the strength of the issuer could influence the strength of the issued debt.</li> <li>• <b>Key Financial Indicators</b> – this will be based on financial analyses of the borrower’s financial strength at least over a period of 3 years, including: <ul style="list-style-type: none"> <li>• Capital strength and quality of assets;</li> <li>• Liquidity analysis, including cash inflows from normal operating activities and recent financing;</li> <li>• Off-balance sheet arrangements; and</li> <li>• Stability and growth of profits.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Character of the issuer</b> – if the willingness of the issuer to meet its financial obligations is unclear (e.g. if the issuer has defaulted on other securities, both now or in the past), the strength of the issued bond should be reconsidered; and</li> <li>• <b>Company specific factors</b> – if the company has excessive exposure to certain jurisdictions and markets, this could influence the strength of the issued bond.</li> </ul>
<b>Sector/Industry-specific factors</b>	<ul style="list-style-type: none"> <li>• <b>Performance of proxy companies</b> – if the issuer broadly falls within the industry groupings listed in the Nairobi Stock Exchange, any significant dip in the performance of the sector should impact the strength of the bond issued.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Changes in fundamental sectoral factors</b> – changes (including regulatory changes) that will significantly impact the performance of companies within the issuers sector should be considered when rating a corporate bond.</li> </ul>
<b>Macro factors</b>	<ul style="list-style-type: none"> <li>• <b>Impact of changes in macroeconomic factors</b> – it is expected that the issuer will have credible audited financial statements with adequate IFRS 7 disclosures. These “What-if” analyses should give an indication of the issuer’s exposure to macroeconomic factors including interest rates and exchange rates.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Regulation and legislation</b> – the impact on the rating of a bond should be considered after changes to regulations and legislation.</li> </ul>

4.2.2. Development of a rating framework

Bonds rated in each category are intended to be able to withstand particular conditions of economic stress without defaulting. The proposed rating framework, based on the factors listed above, is as below:

Qualitative measures	Qualitative measures		
	Weak	Mixed	Strong
	Rating 3	Rating 2	Rating 2
	Rating 2	Rating 1	Rating 1
Qualitative measures	Mixed	Rating 1	Rating 1
	Strong	Rating 1	Rating 0

We expect that this rating should be reviewed at least once every year, or sooner should there be a significant change in any of the factors listed further above.

4.2.3. Transition matrix and triggers for transitioning between stages

The table below illustrates the minimum allowable loss provision ratios for unquoted corporate bonds:

IFRS 9 General model stages	Bond rating	S&P rating	12 Month ECL			Lifetime Expected Credit Loss (ECL)
			*	**	***	
Stage 1	Rating 0	AAA - BBB	0.2%	0.4%	0.5%	
Stage 2	Rating 1	BB	0.7%	1.2%	1.5%	
	Rating 2	B	3.8%	2.8%	4.0%	
	Rating 3	CCC	26.3%	16.7%	30.0%	
Stage 3	Rating 4/Default	<=CC			100%	

\* Global Corporate Annual Default Rates By Rating Category: weighted average long-term average

\*\* Standard & Poor's One-Year Global Structured Finance Default Rates By Refined Rating Category, 1978-2008

\*\*\* TASK Recommended minimums

4.2.4. Loss given default

Insurers will use their historical experience to determine the expected loss given default ratios for each class of financial instruments. Where internal historical experience is not available. Insurers may use accredited sources, e.g. rating companies, to determine the LGD ratios that will apply.

Insurers must take into account any collateral that is held against their financial assets in determining the LGD.

# 5. Treatment of Financial Instruments

## 5.1. Treatment of loans, particularly intercompany

- 5.1.1. All loans issued fall within the scope of debt instruments as financial assets. This covers e.g. government or corporate bonds, inter-company loans, policy loans, staff loans and mortgages etc.
- 5.1.2. Classify and measure all loans to determine whether they will be reported at amortized cost, at fair value through profit and loss (FVPL) or at fair value through other comprehensive income (FVOCI).
- 5.1.3. Estimate and provide for impairment on the loans based on expected loss. This should be done in the three-stage approach with specific consideration for change in credit risk and forward looking assumptions.
- 5.1.4. Intercompany loans may be considered low credit risk if it meets the required conditions (as such it would depend on the financial strength of the intercompany).  
If low risk, estimate and provide for impairment in a simplified one stage approach: Put the loan in one bucket e.g. stage 1 and assess the 12 month ECL. If this applies, then the entity does not need to assess the assets for SICR unless the initial criteria for categorizing the asset as low risk has changed.

## 5.2. Cash and Equity investments

- 5.2.1. The measurement of cash remains unchanged under IFRS 9, it is measured at amortised cost. While impairment of cash is in scope for IFRS 9, the impact of this is not expected to be material.
- 5.2.2. Equity instruments do not generate contractual cash flows and are basically allocated to the FVPL (Fair Value Through Profit or Loss) category. However, if an equity instrument is not held for trading an entity can make an irrevocable election at the time of initial recognition to record changes in fair value through FVOCI (Fair Value Through Other Comprehensive Income) instead with only dividend income recognized in profit or loss. Investments in equity instruments are outside the scope of IFRS 9 impairment requirements.

Financial Asset	IAS 39 Measurement	IFRS 9 Measurement	IFRS 9 Impairment
Cash	Amortised cost	Amortised cost	In scope (impact not material)
Equities	FVOCI/FVPL	FVOCI/FVPL	Not applicable

## 5.3. Insurance and Reinsurance Receivables

- 5.3.1. All insurance contracts in the Republic of Kenya are required to be on a **Cash and Carry** basis. This means that all contractual premium payments to the insurer are payable in advance on or before the commencement or renewal date of the insurance cover/contract. However the customary business practices in Kenya do not allow for this in all circumstances.

- 5.3.2. Insurers are therefore recommended to put in place a robust Credit Policy approved by the company Board of Directors and enforced by Management. The credit policy should cover the following key areas;
1. Qualification criteria for potential/current clients/policyholders whom shall be eligible to receive credit i.e. allowed to pay the full premium payment after the commencement/renewal date of the insurance contract.
  2. Maximum credit term allowable e.g. 60 or 90 days
  3. Definition of the grace period after the payment due date within which premium must be received before cancellation of the insurance cover/contract.
  4. Definition of default.
  5. Triggers (e.g. after 90 days from the commencement/renewal date) for specific actions (e.g. issuance of demand letters, bad debtor listing with the credit reference bureau etc.) that shall be taken by management to recover the outstanding debt obligations i.e. the premium due for insurance cover provided between the commencement date and policy cancellation date.
  6. Standards and processes for setting aside provisions for bad/doubtful debts and write-offs.
  7. Standards and processes for the approval of special/custom credit requirements that are outside the scope of the standard provisions of the Credit Policy.
- 5.3.3. Where special/custom credit terms/requirements are provided to a specific client/policyholder. This should be carried out formally through a contract executed by both counterparties i.e. the insurer and policyholder/client. The custom contract should cover all the key areas discussed in 3.2 above.
- 5.3.4. In circumstances where the insurer is a lead co-insurer for specific insurance contracts and initially pays out claims in full to the policyholder and subsequently recovers from the other “follower” co-insurers is also exposed to credit risk and shall be required to measure and set aside provisions for expected credit losses on these receivables.
- 5.3.5. Reinsurance (or Retrocession) treaties (or contracts) should also have clear explicit credit terms and obligations that apply to both parties i.e. the insurer and reinsurer.

## 6. Impairment Methodology

- 6.1.1. The objective of the impairment is to determine whether impairment for receivables will be carried out using the general model or whether they will qualify for the simplified approach.
- 6.1.2. The general model is as illustrated in section 3.2. The model includes some simplifications for trade receivables, contract assets and lease receivables, because they are often held by entities that do not have sophisticated credit risk management systems.

### **SIMPLIFICATION APPROACH**

- 6.1.3. These simplifications eliminate the need to calculate 12 month ECL and to assess when a significant increase in credit risk has occurred. The impairment is thus measured at initial recognition and throughout its life at an amount equal to lifetime ECL. As a practical expedient, a provision matrix can be used to estimate the impairment amount for the receivables.

- 6.1.4. Insurance companies whose premium receivables are recovered within 360 days are likely to qualify for the simplification approach. In this case, there is unlikely to be a significant difference in the impairment amounts between the general approach and the simplification approach.
- 6.1.5. The provisioning matrix should be determined based on the insurance or reinsurance company’s historical default rate over the expected life of the insurance or reinsurance receivable and is then adjusted for forward looking estimates.

	0-30 days	60 - 90 days	90-180 days	> 180 days
Historical default rate	0.30%	1.60%	3.60%	10.60%
Forward looking assumptions	1.20%	2.20%	3.10%	4.30%
Default rate (a)	0.304%	1.64%	3.71%	11.06%
Gross amount (b)	100,000	200,000	345,000	32,457
Lifetime ECL (=a*b)	304	3,270	12,805	3,588

### GENERAL MODEL APPROACH

- 6.1.6. However to the extent that an insurance or reinsurance company has debts, which based on the contract, are still valid after 360 days then may be required to use the general approach. This is quite common especially for reinsurance companies that write non-proportional treaties.
- 6.1.7. The insurer (or reinsurer) shall carry out an experience investigation to determine its forward looking loss provisioning ratios measured on a best estimate basis allowing appropriately for the probability of default and the time-value of money.
- 6.1.8. The insurer (or reinsurer) shall not solely really on past/historical information, if reasonable and supportable forward-looking is available without undue cost or effort as at the reporting date to determine the loss provisions ratios that will apply to each class of receivables.
- 6.1.9. The insurer (or reinsurer) shall estimate loss provisioning ratios for receivables that reflect the significant increases in credit risk into the following three stages i.e. in Stage 1, Stage 2 and Stage 3.
- 6.1.10. The definition of these stages shall vary between insurance and reinsurance (or retrocession) receivables and the age of the receivable as at the reporting date. The age of each receivable amount shall be computed as the number of days between the insurance cover commencement/start date and the reporting date.

IFRS 9 stage	Loss Provisioning Stages	Insurance Receivables Aging in Days	Reinsurance Receivables Aging in Days
Stage 1	Rating 0	Less than 1 day	Less than 1 day
	Rating 1	1 day to 30 days	1 day to 60 days

<b>Stage 2</b>	<b>Rating 2</b>	31 days to 60 days	61 days to 120 days
	<b>Rating 3</b>	61 days to 90 days	121 days to 180 days
<b>Stage 3</b>	<b>Default</b>	Over 90 days	Over 180 days

- 6.1.11. The loss provisioning ratios shall be computed by first carrying out an experience investigation with the entity's own historical data. The investigation should cover at least five (5) years to establish a trend.
- 6.1.12. The computation of the loss provision ratios shall take the following steps;
1. For each historical calendar/financial year the ageing analysis should be carried out per class/type of receivable.
  2. Using the information available at the reporting date establish the proportion/percentage of the outstanding receivables amount in each year, that were paid/settled before and after default (i.e. after 90 days for insurance receivables or 180 days for reinsurance receivables) in each stage i.e. 1, 2, and 3.
  3. The percentage/proportion of the receivables settled (or not) after default shall represent the actual loss provision for each stage for that specific historical year.
  4. The average historical loss provision ratios over the five (5) year period for each stage (i.e. 1, 2 and 3) shall be the starting point in determining the best estimate loss provision ratios, before taking into account any current or forward looking information available at the reporting date.
  5. The loss provision ratios determined or calculated from the process above shall not be lower than the prescribed minimum loss provision ratios in section 4.8 below.
- 6.1.13. The table below illustrates the minimum allowable loss provision ratios for all types/classes of receivables;

<b>IFRS 9 stage</b>	<b>Loss Provisioning Stages</b>	<b>Loss Provision Ratios for All Receivables</b>
<b>Stage 1</b>	<b>Rating 0</b>	0.0%
	<b>Rating 1</b>	1.0%
<b>Stage 2</b>	<b>Rating 2</b>	3.0%
	<b>Rating 3</b>	20.0%
<b>Stage 3</b>	<b>Default</b>	100.0%

- 6.1.14. Once the best estimate loss provision ratios have been determined, the "expected credit losses" for the receivables shall be computed by applying the ratios varying stage for the all outstanding receivables at the reporting date.
- 6.1.15. With the exception of the gross premium and any reinsurance/profit commission income the loss provision ratios shall be applied on the total outstanding amount. With respect to premium and commission income; the loss provision ratios shall be applied on earned premium income and earned commission income proportion of the total outstanding receivable amount.
- 6.1.16. With respect to other types/classes of receivables (i.e. non-insurance and non-reinsurance (or retrocession) receivables) where no guidance has been provided. The methodology that should be applied (including the three (3) stage ageing analysis) is that of insurance receivables. The aging analysis would then be carried out from the payment due date.

## 7. Impact of IFRS 9 on Solvency

- 7.1.1. The impact of IFRS 9 on an insurer's solvency position is two-fold. As the standard covers classification and measurement of both financial assets and liabilities:
- Changes in the measurement of financial assets in scope for IFRS 9 and defined as admissible under the risk based capital (RBC) guidelines set by the IRA may result in a decline in the asset value.
  - Changes in the impairment of financial instruments in scope for IFRS 9 and defined as admissible liabilities under the RBC guidelines may result in an increase in provisions and consequently admissible liabilities.
- 7.1.2. The changes in measurement of financial instruments as described in 7.1.1. may affect the amount of capital available to meet the regulator's minimum capital requirement. This will probably have an adverse effect on the insurer's solvency position.

## 8. Appendices

### 8.1. Loan Agreement Standards

All loans; both secured and unsecured should be backed by a loan agreement. All loan agreements should meet the following standards;

1. Full names, tax numbers and addresses of all the parties entering into the agreement.
2. Full details of the initial amount borrowed and any other additional fees, charges, expenses that will be met by the borrower(s) or levied by the lender(s).
3. Interest to be charged i.e. either the formula (for a variable rate loan) or the fixed rate (for a fixed rate loan).
4. If a debt is to be paid by installments, put down full details of the amounts (or the method used to determine the amount) to be repaid, on what dates and when the first and last payments are to be made.
5. If security is to be given for the loan the agreement should have the full details of the security (e.g. property) and the form of encumbrance used.
6. The agreement should be signed (under seal for legal entities) and dated by the parties.
7. The signatures of the parties should be witnessed by an independent 3rd party who should give their full details & address.

### 8.2. General Expected Credit Loss Model

Definitions

1. **ECL** = Expected Credit Losses
2. **n** = Outstanding term of loan or credit exposure in years
3. **t** = time "t" and begins from "0, 1, 2, 3, ..., n" can be in; months, quarters or years
4. **12MECL<sub>t</sub>** = 12 month Expected Credit Losses at "time t"

5. **LTECL<sub>t</sub>** = Life Time Expected Credit Losses at “time t”
6. **PD<sub>t</sub>** = Probability of Default at “time t” (Range is [0,1] and where PD<sub>0</sub> = 0)
7. **ND<sub>t</sub>** = Probability of NOT Defaulting at “time t” (where; ND<sub>t</sub> = 1 – PD<sub>t</sub> and ND<sub>0</sub> = 1)
8. **LGD<sub>t</sub>** = Loss Given Default at “time t” (Range is [0,1] and where LGD<sub>0</sub> = 0)
9. **EAD<sub>t</sub>** = Exposure At Default at “time t”
10. **V<sub>t</sub>** = Value of loan at “time t” without any allowance for ECL and cash flows are discounted at the risk-free rate of interest at “time t”
11. **V'<sub>t</sub>** = Value of loan at “time t” with an allowance for 12 month expected credit losses and cash flows are discounted at the risk-free rate of interest at “time t”
12. **V''<sub>t</sub>** = Value of loan at “time t” with an allowance for life time expected credit losses and cash flows are discounted at the risk-free rate of interest at “time t”
13. **C<sub>t</sub>** = Value of collateral at “time t”
14. **R<sub>t</sub>** = interest and/or principle payment/re-payment of the loan due at “time t”
15. **E<sub>t</sub>** = Expenses expected to be incurred at recovery of the loan or collateral at “time t”
16. **Y<sub>t</sub>** = Risk-free rate of interest at “time t”

### 8.3. Boundaries

1. PD<sub>0</sub> = 0 and therefore ND<sub>0</sub> = 1
2. V<sub>n</sub> = V'<sub>n</sub> = V''<sub>n</sub> = 0
3. 12MECL<sub>n</sub> = 0
4. LTECL<sub>0</sub> = 0

### 8.4. Mathematical Formulas

$$V_t = \frac{R_{t+1}}{(1 + Y_{t+1})^1} + \frac{R_{t+2}}{(1 + Y_{t+2})^2} + \dots + \frac{R_{n-1}}{(1 + Y_{n-1})^{n-1}} + \frac{R_n}{(1 + Y_n)^n}$$

$$V_t = \sum_{i=t}^{i=n-1} \frac{R_{i+1}}{(1 + Y_{i+1})^{i+1}}$$

$$LGD_t = 1 - \text{Min} \left[ 1, \frac{C_t}{V_t} \right]$$

$$EAD_t = V_t + E_t$$

$$12MECL_0 = \frac{EAD_1 \times LGD_1 \times PD_1}{1 + Y_1}$$

$$LTECL_0 = \sum_{t=1}^{t=n} \frac{EAD_t \times LGD_t \times PD_t \times \prod_{t=0}^{t=n-1} ND_t}{(1 + Y_t)^t}$$

$$V'_t = V_t - 12MECL_t$$

$$V''_t = V_t - LTECL_t$$



## 8.5. Key Assumptions

1. Time “ $t=0$ ” is the reporting date.
2. The time period (or frequency) “ $t = 0, 1, 2, 3, \dots, n$ ” is in years.
3. The risk-free spot rates shall be calculated from the NSE yield curve at the reporting date.
4. All interest and loan payments/re-payments that are in arrears; are not taken into account in  $V_t$  as it should be classified as a receivable.

## 8.6. Source of Data

1. Entity specific data shall be the preferred source of data to determine the “ $PD_t$ ” assumptions over the term of the loan. Otherwise industry or market specific data should be used only if the entity specific data is not available.