



# IFRS 9: Significant Increase in Credit Risk

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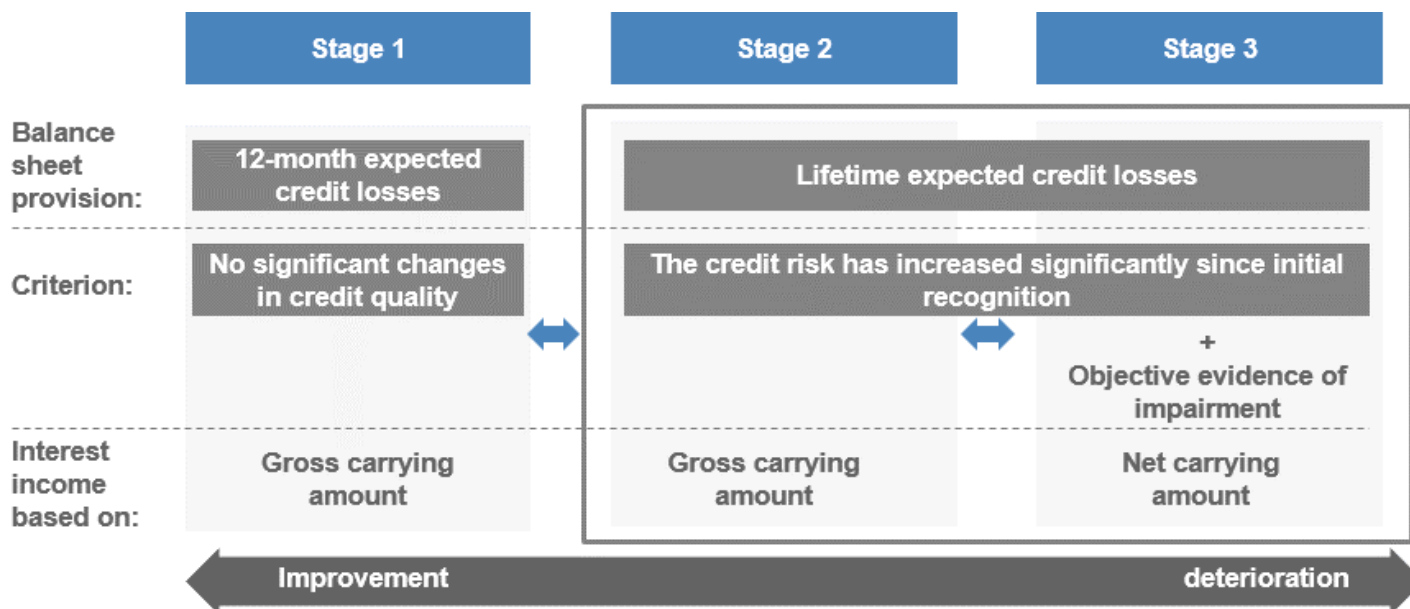
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## Introduction

- This presentation explores one of the most subjective components of IFRS 9 (European interpretation) together with a comparison of industry approaches taken, key metrics to measure its effectiveness and potential enhancements.
- In July 2014, the final version of the IFRS 9 Accounting Standard was issued to replace IAS 39 from 2018. Key changes introduced were:
  - A change from an ‘incurred credit loss’ model to ‘expected credit loss’ (ECL) model.
  - Introduction of Significant Increase in Credit Risk (SICR) criteria together with 3 possible stages.
  - More timely and forward-looking information required (based on multiple economic scenarios).
  - Increased expert and management judgment particularly around scenarios, weighting of scenarios and the SICR approach.
- One of the critical components of IFRS 9 is the concept of Significant Increase in Credit Risk (SICR). This is a key driver of stage allocation which determines whether a 12 month or a lifetime Expected Credit Loss (ECL) is recognised.
- From regulatory communications and peer benchmarking exercises, it is apparent that the assessment of SICR criteria is a new and subjective challenge across the industry.
- This presentation explores some of the approaches currently taken and describes key analysis and metrics to measure the effectiveness of the different SICR approaches and the sensitivity of related tolerances.

## Summary of Stages

- There is a requirement to hold expected loss over different outcome periods (12 month/lifetime) based on performance category. IFRS 9 summarises these into three Stages:

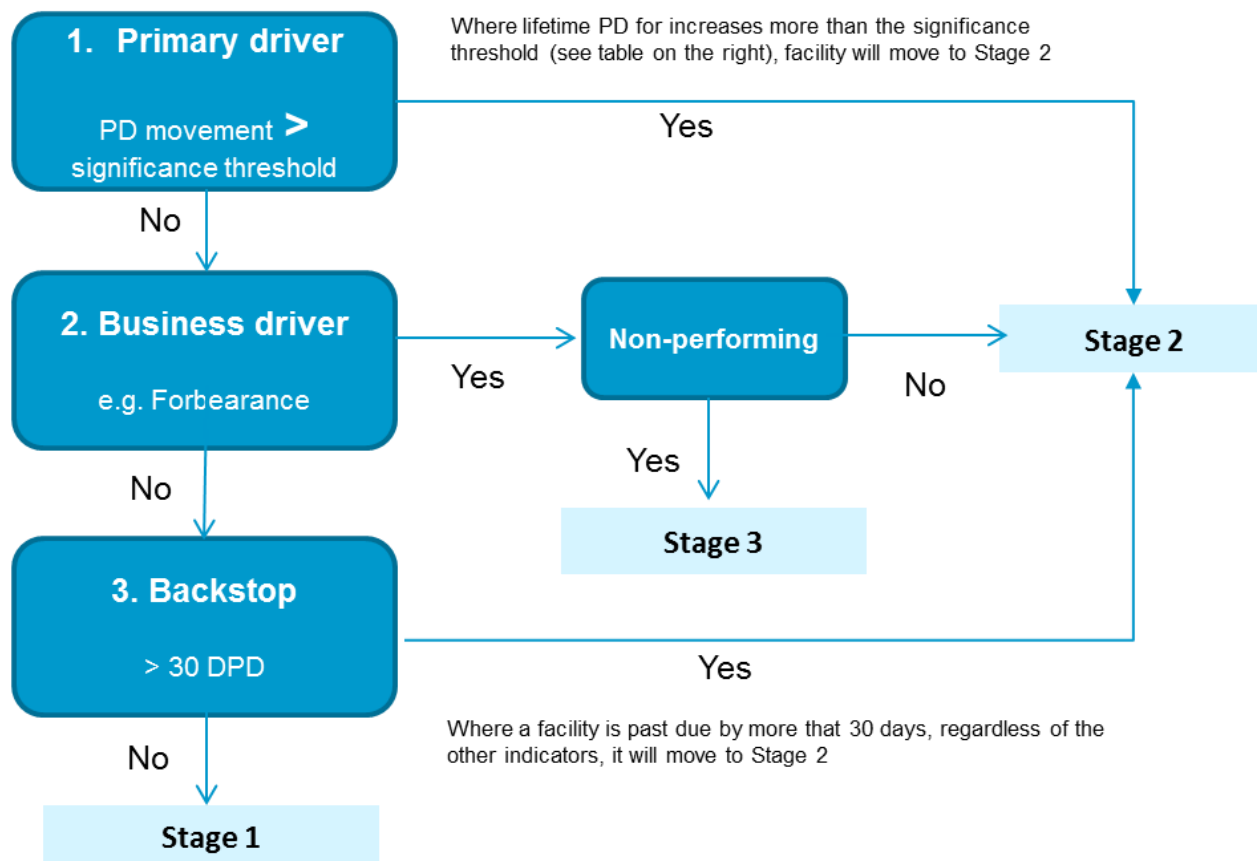


- While the definitions of what constitutes impaired, unimpaired and significantly deteriorated will be set by individual lenders, the structure of the reporting and the guidance in developing the stages are common to all lenders.
- Stage 1:** Upon origination or purchase, 12-month expected credit losses are recognised in profit or loss. The exception is those who are credit impaired (POCI) which are assigned to stage 3.
- Stage 2:** If credit risk increases significantly from when the entity originates and the resulting credit quality is not considered to be low credit risk, full lifetime expected credit losses are recognised.
- Stage 3:** If the credit risk of a financial asset increases to the point that it is considered credit-impaired, lifetime expected credit losses are still recognised. Interest revenue is calculated based on the amortised cost (i.e. the gross carrying amount adjusted for the loss allowance).

# Significant Increase in Credit Risk Overview

- Determination of SICR is important as this will result in an instrument moving from Stage 1 to Stage 2 (12m PD → Lifetime PD)

## Which drivers to use as transfer criteria



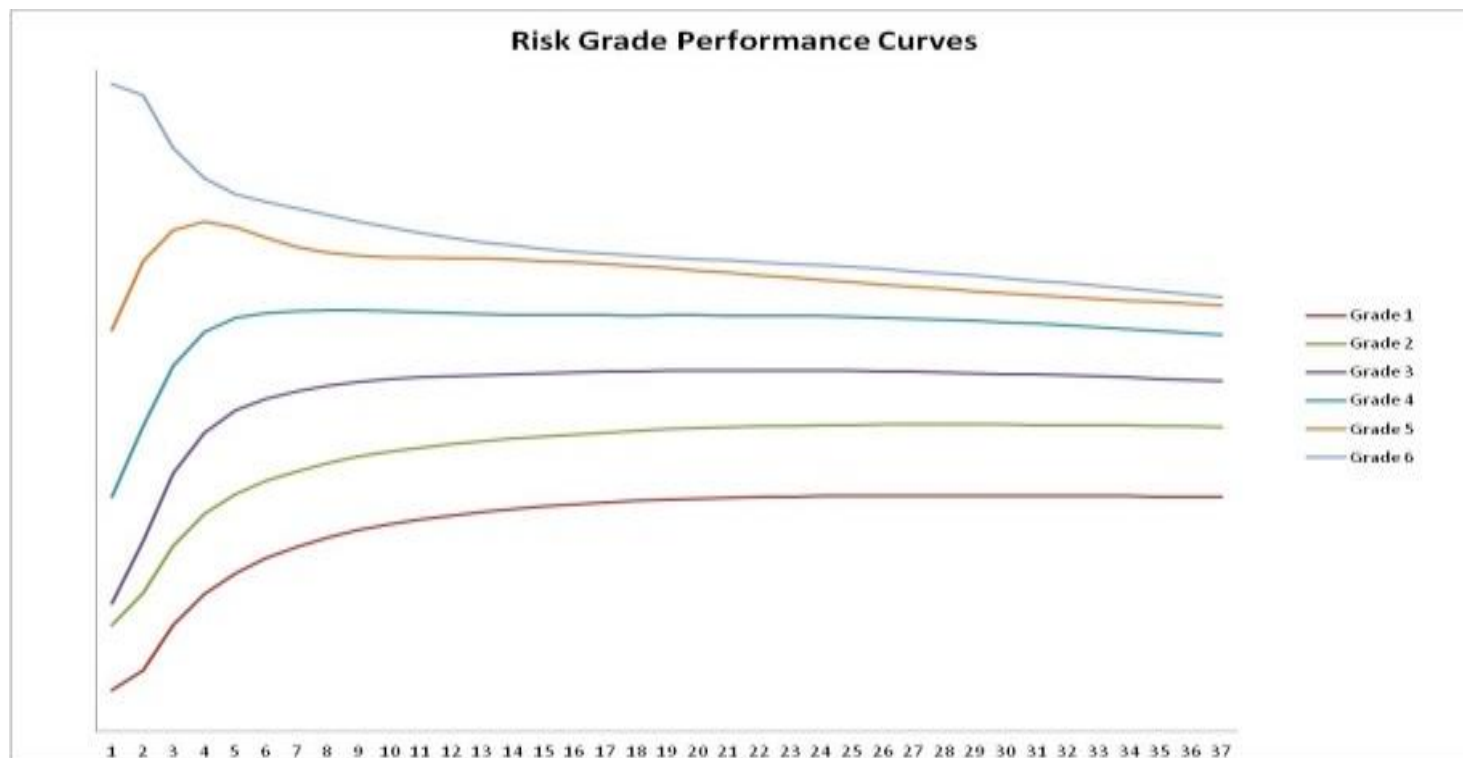
- ‘At each reporting date, an entity shall assess whether the credit risk on a financial instrument has increased significantly since initial recognition.’ [IFRS 9 5.5.9].
- The standard goes on to acknowledge that the comparison needs to take into account the remaining expected life of the product:
- ‘The change in credit risk cannot be assessed simply by comparing the change in the absolute risk of a default occurring over time. For example, if the risk of a default occurring for a financial instrument with an expected life of 10 years at initial recognition is identical to the risk of a default occurring on that financial instrument when its expected life in a subsequent period is only five years, that may indicate an increase in credit risk’ [IFRS 9 B5.5.11].

## SICR Challenges

- There are some challenges to identifying the best SICR criteria including the following:
  - **Wide range of possible approaches:** There are a number of approach across the industry and between different portfolios within the same lender.
  - **Definition of initial recognition point:** Many accounts (e.g. mortgages) can be open for several years. Data availability/system resource constraints may make it impossible to fully replicate the IFRS 9 models for all accounts retrospectively.
  - **Economic outlook:** If forward looking economics are included within the SICR comparisons then a shift in economic outlook can result in an increase in the stage 2 population even although the risk of each individual account hasn't necessarily changed.
  - **Initial risk banding at origination** is not necessarily a good predictor of future risk e.g. the highest risk customers will have a higher probability of defaulting and closing over time, whereas in the lowest risk band some customers will generally deteriorate over time. So there is a general regression towards the mean. Limit management and initial risk based pricing also impact how accounts perform over time. High risk customers at origination are likely to be less likely to trigger SICR criteria whereas low risk customers can be very sensitive to increases in risk. Therefore, the absolute change in PD that is considered significant should be less accounts in high grade risk grades at origination relative to those in low risk grades.
  - **Setting the correct thresholds:** Determining what threshold would be considered a significant increase in credit risk can be very subjective. The risk of recognising expected losses too late should be balanced against setting the thresholds too wide, resulting in accounts moving in and out of the Stage 2 without this truly reflecting a significant change in credit risk.

## Initial Risk Banding at Origination

- For stochastic processes in general:
  - If you only know your starting point then there is uncertainty on your future state
  - If you start at an extreme it is unlikely you will stay there
- The chart below illustrates how the default rate of the risk grades move through time.
- Default rates in the lowest risk grades generally increase over time as the information used to assign the grade becomes more out of date, while default rates for the highest risk grades decrease over time and there is a general regression towards the mean.



## Industry Approaches

### Comparison between different PD metrics

- Remaining lifetime PD at origination to lifetime PD now (or equivalent 12 month PD comparisons)
- Fixed PD threshold based on 12 month or lifetime PD in reporting month
- Thresholds set on different segments such as origination PD, term, initial loan amount

### Different combinations of thresholds used

- Relative increase e.g. 50% would mean a change from 2% to 3%
- Absolute increase e.g. 2% would mean a change from 2% to 4%
- Fixed reporting e.g. for example 4% at the reporting date

### Inclusion/Exclusion of a Probation Period

- If there is evidence that there is no longer a significant increase in credit risk, the account should be transferred back to Stage 1. Some lenders prevent volatility through setting a probation period for an account moving back from Stage 2 to Stage 1.

### Inclusion/exclusions of Macroeconomics

- Macroeconomics can be included or excluded from the SICR comparisons. If forward looking economics are included within the SICR comparisons then a shift in economic outlook can result in an increase in the Stage 2 population even although the risk of each individual account hasn't changed.

## Measuring the Effectiveness of Staging: Summary

- With such a wide range of possible approaches, it is important to be able to measure and compare the effectiveness of different staging approaches.
- A balance between the following measures needs to be made:
  - **Pre-Emptive (Non-Delinquent %):** it is important that the SICR criteria does not rely purely on the backstop
  - **Sufficiently Large (Coverage Ratio):** the Stage 2 population should be sufficiently large to capture the population that becomes delinquent in the next 12 months
  - **Accuracy (True Positives):** the higher the number of true positives, the more accurate the staging allocation is.
  - **Predictive (Prediction Rate):** the higher the prediction rate, the more predictive of future delinquency.
- The Matthews Correlation Coefficient is a useful statistic to compare the overall effectiveness of different approaches.

## Measuring the Effectiveness of SICR Criteria: Pre-Emptive

### Pre-Emptive (Non-Delinquent %):

- **Rationale:**

- Measures what proportion of accounts are captured by the PD assessment versus the backstops and any other Business triggers.
- The higher the non-delinquent %, the more pre-emptive the staging allocation is.
- It is important that the SICR criteria does not rely purely on the backstop i.e. that it is pre-emptive.

- **Calculation:**

$$\frac{\text{(Number of accounts that meet the PD deterioration Stage 2 criteria)}}{\text{(Total number of Stage 2 accounts)}}$$

- The Pre-Emptive metric contains all accounts in Stage 2 meeting SICR criteria regardless if they also classify as >30 days past due (backstop) or are captured by any other Business drivers for SICR.
- **Proposed Threshold:**
  - Ideally 100% of Stage 2 would meet the PD deterioration criteria. However, over 90% would be satisfactory.

## Sufficiently Large (Coverage Ratio):

- **Rationale:**

- Measures whether the size of the Stage 2 population is sufficiently large to capture the population that becomes delinquent in the next 12 months. A coverage ratio above 1 means that Stage 2 is bigger than the delinquent population.

- **Calculation:**

$$\frac{\text{(Number of up to date accounts captured by PD Deterioration Stage 2 criteria)}}{\text{(Number of up to date accounts that become >30 DPD or have Business SICR triggers within the next 12 months)}}$$

- ‘Accounts Captured by PD Deterioration’ includes accounts which are in Stage 2 for PD Deterioration and not >30 days past due (backstop) or any other Business SICR triggers.
- **Proposed Threshold:**
  - A coverage ratio below 1 would be a concern as the approach would not be capturing enough accounts. A ratio over 2 would imply that too many accounts are being captured but the PD deterioration criteria.

## Measuring the Effectiveness of SICR Criteria: Accuracy

### Accuracy (True Positives):

- **Rationale:**

- Measures what proportion of up to date Stage 2 accounts experience credit deterioration in the next 12 months. The higher the number of true positives, the more accurate the staging allocation is.

- **Calculation:**

$$\frac{\text{(Number of up to date accounts, captured by PD Deterioration Stage 2 criteria, that become >30 DPD or have Business SICR triggers within the next 12 months)}}{\text{(Number of up to date accounts captured By PD Deterioration)}}$$

- ‘Accounts Captured by PD Deterioration’ includes accounts which are in Stage 2 for PD Deterioration and not >30 days past due (backstop) or any other Business SICR triggers.
- **Proposed Threshold:**
  - If coverage is over 1 the SICR criteria must be capturing accounts who do not become delinquent so whilst a high percentage of true positives is desired anything over 50% would not raise concerns.

## Measuring the Effectiveness of SICR Criteria: Predictive

### Predictive (Prediction Rate):

- **Rationale:**

- Measures what proportion of up to date accounts that become delinquent are captured by the PD assessment. The higher the prediction rate, the more predictive of future delinquency.

- **Calculation:**

$$\frac{\text{(Number of up to date accounts, captured by PD Deterioration, that become >30 DPD or have Business SICR triggers within the next 12 months)}}{\text{(All up to date accounts that become >30 DPD or have Business SICR triggers within the next 12 months)}}$$

- ‘Accounts Captured by PD Deterioration’ includes accounts which are in Stage 2 for PD Deterioration and not >30 days past due (backstop) or any other Business SICR triggers.
- **Proposed Threshold:**
  - Ideally the PD deterioration criteria captures all up to date accounts who then default, but again linked to coverage, a prediction rate over 50% would be acceptable.

## Measuring the Effectiveness of SICR Criteria: MCC

- The Matthews Correlation Coefficient (MCC) is used in machine learning as a measure of the effectiveness of binary classifications.
- In the context of IFRS 9, MCC can be used to measure how well a particular PD threshold performs as a quantitative transfer criterion for stage 2 by looking at true positives, true negatives, false positives and false negatives.
- The value can be between -1 (imperfect classification) and 1 (perfect classification). The higher the value, the stronger the SICR criteria are able to discriminate between stage 1 and stage 2 assets.

$$MCC = \frac{TP \times TN - FP \times FN}{\sqrt{(TP + FP)(TP + FN)(TN + FP)(TN + FN)}}$$

- Where:
  - TP is the number of true positives
  - TN is the number of true negative
  - FP is the number of false positives
  - FN is the number of false negative

## Conclusion

- This presentation has explored some of the approaches currently taken and describes key analysis and metrics to measure the effectiveness of the different SICR approaches and the sensitivity of related tolerances.
- A balance between the following measures needs to be made:
  - **Pre-Emptive (Non-Delinquent %):** it is important that the SICR criteria does not rely purely on the backstop
  - **Sufficiently Large (Coverage Ratio):** the stage 2 population should be sufficiently large to capture the population that becomes delinquent in the next 12 months
  - **Accuracy (True Positives):** the higher the number of true positives, the more accurate the staging allocation is
  - **Predictive (Prediction Rate):** the higher the prediction rate, the more predictive of future delinquency.
- The Matthews Correlation Coefficient is a useful statistic to compare the overall effectiveness of different approaches.
- There are a large number of different approaches taken across the industry including:
  - Differences in whether residual lifetime or 12 month PDs are used in the PD deterioration comparisons
  - Different combinations of absolute, relative and/or fixed thresholds used
  - The inclusion or exclusion of a probation period for returning to stage 1 from stage 2 to prevent volatility
  - The inclusion or exclusion of macroeconomics within the PDs used in the PD deterioration comparisons
- Future enhancements could be made across the industry by combining these approaches alongside using the proposed measures of effectiveness to find the optimal combinations for each lender and portfolio.