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| TFRS9 Model Development Document |
| POD Portfolio |
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Document History

This section documented the revision history and version control of this document. It shall record every major and minor revision of the model development regarding the Probability of Default (PD), Exposure at Default (EAD), and Loss Given Default (LGD) models modules which are used for the purpose of calculation of ECL of the TFRS9 accounting book.

Revision History

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| **Version** | **Phase** | **Revision Date** | **Summary of Changes** | **Page** | **File name** | **Changed by** |
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# Introduction

Probability of default (PD), Exposure at default (EAD), and Loss Given Default (LGD) are three components which are used to calculate credit risk capital and provision. In this document, we are focusing on POD portfolio which is a revolving Loan. The portfolio size of Other Unsecured products is about 1.6 million.

In the current regulatory setting, the provisioning of expected credit loss is calculated from inherent risk parameters; the probability of default (PD), exposure at default (EAD) and loss given default (LGD). Each parameter is estimated by average through the economic cycle from 2012 to 2016 which can be considered as a downturn situation. However, these risk parameters does not reflect future risk exposure. Hence, the TFRS9 which is a new accounting standard is introduced. The impairment under TFRS9 setting also covers forward-looking components which should help improve financial stability and improve bank credit risk.

This document outlines the development process of all model related to the TFRS9 calculation. For each risk component, this document shall clearly state the scope (model usage), methodology considered, model development approach, final model and the initial validation results.

# TFRS9 Expected Credit Loss

On July 24, 2014, the International Accounting Standards Board (IASB) issued the final version of the ‘International Financial Reporting Standard (IFRS) 9 – Financial Instruments’. As a primary component of the new accounting standard, the IASB introduced a forward looking impairment model. The IASB thereby reacted to delayed recognition of credit losses identified as a weakness of existing accounting standards during the course of the global financial crisis (of 2007/08). In particular, the biggest critique of incurred loss approach under IAS 39 was the recognition of credit losses only upon evidence of a trigger event. In this regard, IASB’s approach of forward looking credit loss estimation was evident from the below extract.

*“The new standard requires an entity to recognise expected credit losses at all times and to update the amount of expected credit losses recognised at each reporting date to reflect changes in the credit risk of financial instruments. This model is forward-looking and it eliminates the threshold for the recognition of expected credit losses, so that it is no longer necessary for a trigger event to have occurred before credit losses are recognised. Consequently, more timely information is required to be provided about expected credit losses.” [“Project summary – IFRS 9 Financial Instruments”, IFRS Foundation, 07/2014, p.14][[1]](#footnote-1)*

Following the publication of IFRS 9 Financial Instruments in July 2014, the Basel Committee on Banking Supervision issued their ‘Guidance on Credit Risk and Accounting for Expected Credit Losses’ (GCRAECL) in December 2015. This covers in particular the impairment (Expected Credit Losses) element and how it should be embedded in and supported by internal processes.

Thai Accounting Standards are substantially converged with IFRS Standards, though the financial instruments Standards that are part of IFRS Standards have not yet been adopted. Thai Accounting Standards include several national financial instruments standards that differ from IFRS Standards. Henceforth TFRS9 can be considered as an adaptation from IFRS9 and replaces the existing TAS101.

***Principle 5 states****–A bank should have policies and procedures in place to appropriately validate models used to assess and measure expected credit losses. This presentation will provide an overview of the scope of work and the proposed validation approach for KBank, based on further discussions we will provide a more detailed view of the approach based on the complexity and materiality of the underlying models.*

Changes due to ‘*IFRS 9 – Financial Instruments*’ can be grouped into three categories.

* ***Classification and measurement***: Classification determines how financial assets and liabilities are accounted for in financial statements and, in particular, how they are measured on an ongoing basis:
  + Assets: one classification approach
  + Liabilities: addressing the volatility in profit or loss caused by changes in the credit risk of financial liabilities that are measured at fair value
* ***Impairments***: Forward-looking impairment model based on expected losses:
  + The new model requires entities to recognise expected credit losses at all times (12-month or lifetime expected loss) which includes measurement of changes in expected credit losses
  + It is no longer necessary for a trigger event to have occurred before credit losses are recognised
  + The new model is also accompanied by improved disclosures about expected credit losses and credit risk
* ***Hedge accounting***: Clear alignment with risk management:
  + The rules allow components of non-financial items to be hedged (previously not allowed by IAS 39)
  + IFRS 9 eliminates the distinction between financial and non-financial items and looks at whether a risk component can be identified and measured and therefore reflected in management activities

The primary change from IAS 39 to IFRS 9 is the evolution from an incurred loss view to a forward looking expected loss view which needs to be accounted for in the impairment models.

This new accounting standard will be effective from 2020. The IFRS 9 standard provides a new set of regulations that the new loss provisioning process will need to satisfy.



Figure 1, From IAS39 to IFRS 9

In particular, the new impairment rules require that the lifetime credit risk of an account be assessed at each model run to determine if there has been a significant increase in credit risk since origination. For accounts where the credit risk has significantly increased (including defaults) the lifetime expected credit losses must be used. If the credit risk has not significantly increased, then only credit losses resulting from expected defaults in the next 12 months must be used. The approach is outlined in terms of a stage classification accounting for significant increase in credit risk as a pivotal element of IFRS 9.

**Table** 1**: Stages under IFRS 9**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Stage 1** | **Stage 2** | **Stage 3** |
| **Stage description** | Includes accounts for whom no significant increase in credit risk since initial recognition has been observed | Includes accounts whose credit risk has significantly increased since initial recognition but no objective evidence of impairment has been observed, with a rebuttal presumption that this occurs when the account reaches 30 days past due | Includes accounts where the objective evidence of impairment has been observed |
| 12-month expected credit losses, i.e. credit losses due to default events within subsequent 12 months, are recognised in balance sheet | Lifetime expected credit losses (LTECL) i.e. credit losses due to default events spanning the (expected) lifetime of the facility, are recognised in balance sheet | Lifetime expected credit losses (LTECL) are recognised in balance sheet |
| **Expected loss** | IFRS 9 guidelines require to assess the 1 year expected credit losses without prescribing the tangible estimation procedure    , , , represent marginal PD, EAD and LGD at time *t* | IFRS 9 guidelines require the lifetime expected credit losses without prescribing the tangible estimation procedure   Where, , , , represent marginal PD, EAD and LGD at time *t* and *T* represents the remaining lifetime of the account | Expected loss of a defaulted client given the loss rate, i.e. the shortfall in net present value of expected cash flows versus the carrying amount of the loan |

Table 1: Stages under IFRS 9

The exemplary expected loss (EL) assessment in

Table 1 listed above is based on an estimate of 1 year parameters probability of default (PD), loss given default (LGD) and exposure at default (EAD) for stage 1 and multi-year PD, LGD and EAD assessments for stage 2 including a discount factor to the reporting date.

# Definition

| **Term** | **Acronym** | **Description** |
| --- | --- | --- |
| Days Past Due | DPD | The number of days that an account is currently in arrears |
| Delinquent |  | An asset is described as delinquent if it is associated with any amount of arrears |
| Expected Loss/Expected Credit Loss | EL/ECL | Interchangeable terms. EL = PD\*EAD\*LGD |
| Exposure at Default | EAD | Exposure at Default (EAD) is defined as the expected amount drawn by borrowers at the time of default. |
| Probability of Default | PD | Probability of default (PD) is the risk that the borrower will be unable or unwilling to repay its debt in full or on time. The risk of default is derived by analyzing the obligor’s capacity to repay the debt in accordance with contractual terms. PD is generally associated with financial characteristics such as inadequate cash flow to service debt, declining revenues or operating margins, high leverage or declining liquidity |
| Default customer |  | Default customer is customer who failed to make on-time repayment (>= minimum payment rate) of their loans for more than ninety consecutive days or three months. |
| Credit Conversion Factor | CCF | Credit Conversion Factor (CCF) is defined as percentage rate of current undrawn credit line that will likely be utilized by borrowers at the time of default |
| Lifetime Expected Credit Loss | LTECL / LEL | The Expected Credit Loss over the behavioural lifetime of an asset |
| Beta distribution |  | The beta distribution is a family of continuous [probability distributions](https://en.wikipedia.org/wiki/Probability_distribution) defined on the interval [0, 1] [parametrized](https://en.wikipedia.org/wiki/Statistical_parameter" \o "Statistical parameter) by two positive [shape parameters](https://en.wikipedia.org/wiki/Shape_parameter), denoted by *α* and *β*, |

# Probability of Default

Probability of default (PD) is the risk that the borrower will be unable or unwilling to repay its debt in full or on time. The risk of default is derived by analyzing the obligor’s capacity to repay the debt in accordance with contractual terms. PD is generally associated with financial characteristics such as inadequate cash flow to service debt, declining revenues or operating margins, high leverage or declining liquidity.

With the new IFRS9 loan loss provision, loans are classified in three stages: stage 1 – initial recognition (yet to be impaired), stage 2 – significant increase in credit risk, and stage 3 – objective indicators of impairment. For loans in stage 1, banks need to estimate 1-year expected credit losses. On the other hand for loans in stage 2 and 3, banks need to provide provision and thus estimate expected credit losses for the whole lifetime of the loans. Both the 1-year and lifetime expected credit losses estimation shall reflect the banks’ forward looking macro-economic view.

KBank’s PD estimation for IFRS9 is modeled according to the following principles: (i) the PD estimation for IFRS9 should be point-in-time (PIT) and reflect current market conditions, (ii) the PD estimates should use structural and behavior information, and (iii) estimation of PD should include the forward looking aspect of the macroeconomic outlook specific to particular sector. For loans in stage 1 and 2, the modeled probability of default will be over 12 months and lifetime respectively. For stage 3, the probability default will be at 100%.

## Scope

This probability of default model should be used to create the PD term structure for all valid stage-1 and stage-2 POD instruments. For stage-3 instruments, they are automatically assigned to be at 100%

## Modeling Methodology & Design

We utilize migration and generator matrix from K-express cash portfolio. Please refer to the model development document of K-express cash.

## Model Development

### Supermaster Scale and Rating

The first step in our PD term structure model development is the construction of supermaster rating and supermaster scale PD. For current loan and TDR customer, we use scoring model to create ratings and thus assign a suitable rating for each customer. For other asset classes, we directly observe the long run historical default rate within each asset class and assign them to an appropriate rating in the supermaster scale.

The outcome of this exercise is the supermaster rating and scale as shown below. The PD in each rating is calibrated to the long run default performance up to June 2016.

|  |  |  |  |
| --- | --- | --- | --- |
| **Supermaster Rating** | **Asset\_class** | **PD Master Scale**  **30/1/2018** | **201612**  **Actual DR** |
|
| 4 | PL Normal | 7.99% | Expert judgment |
| 7 | Reschedule | 21.08% |
| 9 | Watch List | 32.27% |
| 11 | TDR | 53.71% |
| 12 | SMQ | 72.83% |
| SMA |

Table 2, Supermaster Scale

Note: Due to inadequate data of POD portfolio, expert judgment is therefore required in order to assign supermaster rating and PD value.

### Probability of default term structure

We utilize migration and generator matrix from housing loan portfolio. Please refer to the model development document of K-express cash.

## Pre-Validation

We utilize migration and generator matrix from K-express cash portfolio. Please refer to the model development document of K-express cash.

# Exposure at Default

Exposure at Default (EAD) is defined as expected outstanding balance at the time of default. In practice, the EAD tends to be the same as its balance including the potential increase in the outstanding balance from a reference date to the time of default. KBank estimates the EAD of revolving credit products by using indirect approach focus on evaluating Credit Conversion Factor (CCF), the proportion of current undrawn amount that will be drawn down at the time of default. Exposure at Default (EAD) is defined as the expected amount drawn by borrowers at the time of default.

For an active revolving instrument (non-NPL), the EAD at reporting date is defined as

Where is current principal amount at time

is current limit amount at time

is Credit Conversion Factor (CCF)

is Effective Interest Rate (EIR)

is a variable acting as an on/off switch for interest calculation

is the number of month for accrued interest to be calculated

is realized accrued interest at time

However, CCF of POD is constant and equal to zero. Thus, EAD for all asset classes are equal to the contractual outstanding.

# Loss Given Default

Loss given default, LGD, can be defined as the share of a defaulted exposure that will never be recovered by the lenders. The loss given default shall be assessed in an economic sense rather than a mere accounting perspective. That said the discount effect associated with the recovery cash flow and cost associated with collecting recoveries shall be considered.

Through-the-cycle LGD of POD is a constant, which is applied for all asset classes. The constant is the same as through-the-cycle LGD of K-Express Cash (KEC) since POD portfolio is small. Therefore, modeling methodology can be found in model development document of KEC.

For point-in-time LGD, there is no model adjustment so point-in-time LGD will be equal to through-the-cycle LGD.

# Criteria for a Significant Increase in Credit Risk (SICR)

Please refer to the model development document of K-express cash.

1. http://www.IFRS.org/current-projects/iasb-projects/financial-instruments-a-replacement-of-ias-39-financial-instruments-recognitio/documents/IFRS-9-project-summary-july-2014.pdf [↑](#footnote-ref-1)