# BPR134: IRB Minimum System Requirements

**Purpose of document**

This document sets out the minimum systems and governance requirements that a bank must satisfy to be able to use its own internal ratings-based (IRB) approach for measuring credit risk for the purposes of calculating its regulatory capital requirements. A bank must satisfy the Reserve Bank that it meets the requirements in this document before it can be accredited to use IRB credit risk models. Once accredited, a bank is subject to a condition of registration requiring it to meet these requirements on a continuing basis.

Banking Prudential Requirements

Document BPR134

**Document version history**

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**Conditions of registration**

The Reserve Bank of New Zealand Act 1989 (the **Act**) permits the Reserve Bank to impose conditions of registration (**conditions**) on registered banks[1].

This document BPR134: IRB Minimum System Requirements forms part of the requirements for the following conditions:*

- An IRB-accredited bank is subject to a standard condition of registration requiring it to comply with the minimum requirements set out in this document, relating to its systems and governance for operating its own internal models for calculating credit risk RWAs.[2]

- An IRB-accredited bank is subject to a condition requiring it to maintain capital ratios above specified minimum levels, and also to a condition imposing restrictions on its dividend payments when its prudential capital buffer ratio falls below specified levels.[3] This document includes certain specifications for how such a bank must model credit risk outcomes for calculating RWAs on credit exposures that are covered by an IRB model. These specifications affect how the bank calculates its day-to-day values for the capital ratios and the capital buffer ratio, which are needed for the bank to monitor its compliance with these capital adequacy conditions.

> *\* All of the material set out in this document forms part of the requirements of the applicable condition, except material that is expressly identified as <u>guidance</u> by being included in a shaded box like this.*

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[1]   The conditions can relate to any of the matters referred to in sections 73 – 73B, 78 and 81. The standard conditions are contained in Appendix 1 of document BS1: Statement of Principles.

[2]   This condition relates to the matters referred to in: section 78(1)(fa) (risk management systems and policies).

[3]   These conditions of registration relate to the matter referred to in: section 78(1)(c) (capital in relation to the size and nature of the business).

# BPR134: IRB Minimum System Requirements

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# Part F: Validation of internal estimates

# Part A: Introduction

## A1 General requirements for IRB approach and use of internal ratings

### A1.1 Overview

(1) This document sets out the minimum requirements for the IRB approach to measuring credit risk for the purposes of calculating capital requirements.

(2) Unless noted otherwise, the requirements for assigning exposures to borrower or facility grades (and the related oversight, validation, and related matters) apply equally to the assignment of retail exposures to pools of homogeneous exposures.

*Source: BS2B, paras 4.217 and 4.218.*

> *Guidance: This document includes a number of requirements applying to the common IRB approach for the sovereign, bank and corporate exposure classes. From 1 January 2022, the IRB approach is no longer available for the sovereign and bank exposure classes, and from that date any references in this document to the sovereign, bank and corporate exposure class should be read as applying only to the corporate exposure class.*

*New text.*

### A1.2 General requirements

(1) A bank's risk rating system used for capital adequacy purposes must enable the bank to rank and quantify risk in a consistent, reliable, and valid fashion.

(2) Rating and risk estimation systems and processes must provide for–

    (a) meaningful assessments of obligor and transaction characteristics; and

    (b) meaningful differentiation of risk; and

    (c) accurate and consistent quantitative estimates of risk.

(3) The systems and processes used must be based on data and analysis that are rigorous, well-established, and plausible. An appropriate degree of conservatism should be incorporated into estimates in response to limitations in the scope or quality of the information and data used. The data and analysis must be clearly documented and such documentation retained.

*Source: BS2B, para 4.219.*

### A1.3 Wider use of IRB approach

(1) In addition to their role in calculating regulatory capital requirements, the internal ratings and risk estimates produced by the bank's risk rating system must also play an essential role in the bank's credit approval, risk management, internal capital allocations, and corporate governance functions.

(2) It is recognised that a bank might not use exactly the same credit risk estimates in its regulatory capital calculations as for all other internal purposes. However, the bank must be able to reconcile the IRB estimates with other internal credit risk estimates in a way that demonstrates the reasonableness of the differences.

> *Guidance: For example, a bank's IRB PD estimates for a portfolio are required to represent the long run default probability of an obligor/facility, expressed over a one year time horizon. A bank's approach to provisioning for that portfolio may use PD or loss estimates based on a different time horizon, and different risk drivers.*

> *The bank should be able to demonstrate the reasonableness of any differences, such as modelling methodologies, and data sources used.*

(3)     A bank must have a credible track record in its use of internal ratings information.

*Source: BS2B, paras 4.260 and 4.261.*

# Part B: Rating system design

## B1     Introduction

### B1.1     Meaning of rating system

The term "rating system" means all of the methods, processes, controls, and data collection and systems that support the assessment of credit risk, the assignment of internal credit-risk ratings, and the quantification of associated default and loss estimates.

*Source: BS2B, para 4.220.*

### B1.2     Use of multiple rating systems

(1)     If a bank uses multiple rating methodologies or systems within an exposure class, the bank must document the rationale for assigning an obligor to a rating methodology or system, and must apply the rationale in a manner that best reflects the risk level of the obligor.

(2)     The bank must not allocate borrowers inappropriately to rating systems with the aim of minimising regulatory capital requirements: that is, "cherry-picking" by choice of rating system is not permitted.

(3)     Each of the rating systems used for IRB purposes must comply with the minimum requirements.

*Source: BS2B, para 4.221.*

## B2     Rating dimensions

### B2.1     Application of subpart

(1)     Sections B2.2 to B2.5 apply to the corporate, sovereign, and bank IRB exposure classes.

(2)     Section B2.6 applies to the retail IRB exposure class.

*New text.*

### B2.2     General requirements: corporate, sovereign, and bank IRB exposure classes

A qualifying IRB rating system must have two separate and distinct dimensions:

(a)         the risk of obligor default (the "obligor rating") (*see* section B2.3); and

(b)         transaction-specific factors (the "facility rating") (*see* section B2.4).

*Source: BS2B, paras 4.222.*

### B2.3     Risk of obligor default (obligor ratings)

(1)     An obligor rating grade must represent an assessment of obligor risk, based on a specified and distinct set of rating criteria, from which estimates of PD are derived.

(2)     A grade definition must include a description of the degree of credit risk typical for obligors assigned to that grade and details of the criteria used to identify that level of credit risk.

(3)  A bank must ordinarily assign the same obligor rating grade to separate exposures to a given obligor, irrespective of any differences in the characteristics of the specific transactions, but–

(a)  in order to take into account country transfer risk, a bank may assign different obligor grades according to whether a facility is denominated in local or foreign currency; and

(b)  a bank may reflect a facility's associated guarantees by an adjustment to the obligor grade.

> *Guidance: If either paragraph (a) or (b) applies, separate exposures to a given obligor may be assigned different obligor grades.*

(4)  The bank's credit policy must articulate the levels of risk implied by each obligor grade, and the grades must be such that perceived and measured risk increases as credit quality declines from one grade to the next.

(5)  In articulating the risk of each grade, the policy must describe both–

(a)  the probability-of-default risk typical for obligors assigned that grade; and

(b)  the criteria used to distinguish that level of credit risk.

*Source: BS2B, paras 4.223 and 4.228 (subpara 1).*

## B2.4  Transaction-specific factors (facility ratings)

(1)  Facility ratings must reflect transaction-specific factors such as collateral, seniority, and product type.

(2)  Facility ratings must reflect only LGD and must take account of factors that influence LGD including, but not limited to, the type of collateral, product, industry, and purpose.

(3)  Obligor characteristics may be included as LGD rating criteria only to the extent that they are predictive of LGD.

*Source: BS2B, para 4.224 (subparas 1 & 3).*

## B2.5  Exception for supervisory slotting approach

(1)  The two-dimensional requirement (as set out in sections B2.3 and B2.4) does not apply to any exposures in the SL sub-class for which the bank uses the supervisory slotting criteria.

(2)  Given the interdependence between obligor and transaction characteristics in SL, the bank may use a single rating dimension that reflects EL by incorporating both obligor strength (PD) and loss severity (LGD) considerations.

*Source: BS2B, para 4.224 (subpara 4).*

## B2.6  General requirements: retail IRB exposure class

(1)  Rating systems for retail exposures must account for both obligor and transaction risk, and must capture all relevant obligor and transaction characteristics.

(2)  A bank must assign each exposure that meets the IRB definition of a retail exposure (*see* Part B4 of BPR133) to a particular pool so as to–

(a)  provide for a meaningful differentiation of risk; and

(b)  group together sufficiently homogenous exposures; and

(c)    allow for accurate and consistent estimation of PD, LGD, and EAD at pool level.

(3)    PD, LGD, and EAD must be estimated for each pool. Different pools may share the same PD, LGD and EAD estimates.

(4)    At a minimum, the bank must take into account the following risk drivers when assigning exposures to a pool:

(a)    obligor risk characteristics; and

> *Guidance: Indicators of a borrower's risk characteristics might include, for example, a measure of the borrower's debt servicing burden and demographic information regarding factors such as age or occupation.*

(b)    transaction risk characteristics, including product and/or collateral types, and cross-collateral provisions where present.

> *Guidance: Indicators of transaction risk characteristics might include, for example, LVR measures, seasoning, guarantees, and seniority.*

*Source: BS2B, paras 4.225 and 4.226.*

# B3   Rating structure

## B3.1   Application of subpart

(1)    Sections B3.2 to B3.6 apply to the corporate, sovereign, and bank IRB exposure classes.

(2)    Section B3.7 applies to the retail IRB exposure class.

## B3.2   Distribution of exposures across grades

A bank must have a meaningful distribution of exposures across grades, with no excessive concentrations on either its borrower-rating or facility-rating scales.

*Source: BS2B, para 4.228 (subpara 2).*

## B3.3   Number of obligor grades

To meet the requirements in section B3.2 in respect of obligor grades, the bank must have a minimum of seven obligor grades for non-defaulted obligors, and one grade for defaulted obligors.

*Source: BS2B, para 4.228 (subpara 2).*

## B3.4   Concentration within obligor grades

(1)    Where a loan portfolio is concentrated in a particular market segment and range of credit risk, there must be enough grades within that range of credit risk to avoid undue concentrations of obligors in particular grades.

(2)    Significant concentrations within a single grade or grades must be supported by convincing empirical evidence that the grade or grades cover reasonably narrow PD bands and that the credit risk posed by each obligor in a grade falls within that band.

*Source: BS2B, para 4.229 (subpara 1).*

**B3.5    Number of facility grades**

(1)    There must be a sufficient number of facility grades to ensure that no single grade contains facilities with widely varying LGDs.

(2)    The criteria used to define facility grades must be grounded in empirical evidence.

*Source: BS2B, para 4.230.*


**B3.6    Rating grades for supervisory slotting approach**

For exposures in the SL sub-class for which the bank uses the supervisory slotting criteria, the bank must have at least four grades for non-defaulted obligors, and one for defaulted obligors.

*Source: BS2B, para 4.229 (subpara 2).*


**B3.7    Distribution of exposures across pools: retail IRB exposure class**

(1)    For each pool of retail exposures identified, the bank must calculate quantitative measures of loss characteristics (PD, LGD, and EAD).

(2)    There must be a sufficient number of exposures in each pool to ensure meaningful quantification and validation of loss characteristics at the pool level.

(3)    No single pool may include an undue concentration of the total retail exposure.

*Source: BS2B, para 4.231.*


# B4    Rating criteria

**B4.1    Meaningful and consistent rating criteria**

(1)    A bank must use specific rating definitions, processes, and criteria to assign exposures to grades within a rating system, and those definitions and criteria must result in a meaningful differentiation of risk.

(2)    Rating-grade descriptions and criteria must enable obligors or facilities that pose similar risk to be consistently assigned to the same rating grade.

> *Guidance: This consistency should exist across lines of business, departments, and geographic locations within a bank.*

(3)    If rating criteria and procedures differ across different types of obligors or facilities, the bank must monitor rating outcomes for possible inconsistencies, and must alter rating criteria to improve consistency where appropriate.

*Source: BS2B, paras 4.227 (1st two sentences) and 4.232 (subparas 1&2).*


**B4.2    Rating definition to be documented and consistent with internal standards**

(1)    Rating definitions must be documented in a way that allows third parties (such as internal audit or an equally independent function) to understand the assignment of ratings, to replicate rating assignments, and to evaluate the appropriateness of the grade/pool assignments.

(2)    The rating criteria must be consistent with the internal lending standards employed by the bank, and with its policies for managing obligors and facilities that have deteriorated in credit quality.

### B4.3 Information to be used

(1) All relevant and material information must be considered when obligor and facility ratings are assigned, and that information must be up to date.

> *Guidance: An external rating can be the primary factor determining an internal rating assignment. However, the bank must ensure that it considers other relevant information.*

(2) The less information the bank has, the more conservative it must be in assigning exposures to obligor and facility grades or pools.

### B4.4 Use of supervisory slotting criteria

(1) If a bank has exposures in the SL sub-class for which it uses the supervisory slotting approach, the bank must assign those exposures to its internal rating grades based on its own criteria, systems, and processes, subject to compliance with the requisite minimum requirements outlined in this document.

(2) The bank must map these internal obligor grades into the five supervisory rating categories identified in Part C9 of BPR133.

> *Guidance: Tables 1 to 4 in the Appendix to BPR 133 provide, for each sub-class of SL exposures, the general assessment factors and characteristics exhibited by the exposures that fall under each of the supervisory categories. Each lending activity has a unique table describing the assessment factors and characteristics.*

## B5 Rating assignment horizon

### B5.1 Ratings to be assigned over long run

Although PD must be estimated using a one-year horizon (*see* section E1.2(3)), a bank must use a longer time horizon to assign obligor ratings.

### B5.2 Assessment of obligor rating

(1) An obligor rating must represent an assessment of the obligor's ability and willingness to comply with the obligor's contractual obligations, even in the face of adverse economic conditions or unexpected events.

> *Guidance: For example, a bank might base rating assignments on specific stress scenarios. Alternatively, a bank might take into account borrower characteristics that are reflective of the borrower's vulnerability to adverse economic conditions or unexpected events, without explicitly specifying a stress scenario.*

(2) The range of economic conditions considered when making such assessments must be consistent with current conditions and those that are likely to occur over a business cycle within the respective industry and geographic region.

(3)    Given the difficulties in forecasting future events and the influence they will have on a particular obligor's financial condition, a conservative view must be taken when assessing the implications of projected information.

(4)    The obligor ratings for highly leveraged financial institutions (for example, hedge funds) or borrowers whose assets are mainly traded assets, must reflect the performance of the underlying assets based on periods of stressed market volatilities.

> *Guidance: Typical characteristics of highly leveraged financial institutions include, but are not limited to, investment strategies intended to generate returns with low correlation to equity and bond indices, the use of complex investment structures, the use of high leverage to increase returns, the use of derivatives for speculative purposes, the use of short-selling, and fees that are materially based on investment performance.*

*Source: BS2B, para 4.235, 4.235A and 4.236.*

## B6    Design of models

### B6.1    Requirement for human judgement and oversight

(1)    When credit scoring models or other mechanical procedures are used (whether as the primary or a subsidiary basis) for making ratings assignments, the outcome of the model or mechanical procedure must be supplemented by human judgement and human oversight, to ensure that all relevant and material information is considered and that the model or other mechanical procedure is used appropriately.

(2)    Human review of model-based assignments should focus on finding and limiting errors associated with known model weaknesses, and must also include credible ongoing efforts to improve the model's performance.

(3)    The bank must have written guidance describing how human judgement and model results are to be combined.

*Source: BS2B, 1st un-numbered para following para 4.236.*

### B6.2    Other requirements applying to design of models

(1)    The models or procedures used, and the variables used in those models, must have good predictive power and their use must not distort regulatory capital requirements.

(2)    The model must be accurate on average across the range of obligors or facilities to which the bank is exposed, and there must be no known material biases.

(3)    A process must be in place for vetting data inputs into a statistical default or loss prediction model. That process must include an assessment of the accuracy, completeness, and appropriateness of the data that are specific to the assignment of an approved rating.

(4)    The data that a bank uses to build a model must be representative of the population of the bank's actual obligors and/or facilities.

(5)    There must be a regular cycle of model validation as provided for in Part F.

*Source: BS2B, rest of un-numbered paras following para 4.236.*

# B7  Documentation of rating system design

**B7.1  General requirements**

(1)  A bank must document the design and operational details of its rating systems.

(2)  The documentation referred to in subsection (1) must–

(a)  contain evidence of the bank's compliance with the minimum requirements; and

(b)  address all relevant topics, including–

(i)  portfolio differentiation; and

(ii)  rating criteria; and

(iii)  responsibilities of parties that rate obligors and facilities; and

(iv)  definition of what constitutes a rating exception; and

(v)  parties that have authority to approve exceptions; and

(vi)  frequency of rating reviews; and

(vii)  management oversight of the rating process.

(3)  The bank must also–

(a)  document the rationale for its choice of internal rating criteria; and

(b)  be able to demonstrate that the rating criteria and procedures used result in ratings that meaningfully differentiate risk; and

(c)  document the organisational structure for assigning ratings, including the internal control structure.

*Source: BS2B, para 4.237.*

**B7.2  Changes to rating process**

(1)  The bank must periodically review rating criteria and procedures, to determine their continued appropriateness.

(2)  The bank must document–

(a)  the history of major changes in its credit risk rating process; and

(b)  the justification for those changes.

*Source: BS2B, para 4.237 (last 2 sub-paras).*

**B7.3  Documentation of "default" and "loss"**

The bank must document the specific definitions of "default" and "loss" that it uses internally, and those definitions must be consistent with the definitions in subparts E2 and E6.

*Source: BS2B, para 4.238.*

**B7.4  Requirements where statistical models or mechanical methods used**

(1)  If the bank uses statistical models or mechanical methods in the rating process, it must document the methodologies used.

(2)  The documentation referred to in subsection (1) must–

(a) contain a detailed outline of the theory, assumptions, and/or mathematical and empirical basis for the assignment of estimates to grades, individual obligors, exposures, or pools, and the data source(s) used to estimate the model; and

(b) set out the statistical process (including out-of-time and out-of-sample performance tests) for validating the model; and

(c) indicate any circumstances under which the model does not, or is not expected to, work effectively.

(3) If a bank obtains a model from a third-party vendor that claims proprietary technology is used, the bank must still meet the documentation requirements imposed under this section.

*Source: BS2B, para 4.239.*

# Part C: Risk rating system operations

## C1    Coverage of ratings

### C1.1    Loan approval process requirements

(1)    A bank must, as part of the loan approval process for any exposure in the IRB corporate, sovereign, and bank exposure class,–

    (a)    assign obligor ratings to the borrower and to any eligible guarantor or credit protection provider; and

    (b)    assign a facility rating to the exposure.

(2)    A bank must, as part of the loan approval process for any exposure in the retail IRB exposure class, assign the exposure to a pool.

*Source: BS2B, para 4.240.*

### C1.2    Treatment of separate legal entities

(1)    A bank must rate separately each separate legal entity to which the bank is exposed.

(2)    The bank must have policies regarding the treatment of individual entities in a connected group.

(3)    Those policies must identify the circumstances in which the same rating may or may not be assigned to some or all related entities and must include a process for the identification of specific wrong-way risk.

> *Guidance: A bank is exposed to "specific wrong-way risk" if the potential future exposure to a specific counterparty is highly correlated with the counterparty's probability of default due to the nature of the transactions with the counterparty.*

*Source: BS2B, para 4.241.*

## C2    Integrity of rating process

### C2.1    Application of subpart

(1)    Sections C2.2 and C2.3 apply to the corporate, sovereign, and bank IRB exposure classes.

(2)    Section C2.4 applies to the retail IRB exposure class.

### C2.2    Independence of ratings and rating reviews

(1)    Rating assignments and periodic rating reviews must be completed or approved by a party that does not directly stand to benefit from the extension of credit.

(2)    The operational processes underlying rating assignments must be documented in a bank's procedures and incorporated into the bank's policies.

(3)    Credit policies and underwriting procedures must reinforce and foster the independence of the rating process.

(4)    Obligor ratings and facility ratings should be reviewed at least annually. The bank must document and monitor instances where ratings have not been reviewed within a 12-month period, and have procedures in place to minimise the number of such overdue ratings. Overdue ratings must be reviewed within one month of becoming

overdue. Credits must be reviewed more frequently if appropriate (especially, but not limited to, higher risk obligors or problem exposures).

(5)     The bank must initiate a rating review if material new information on an obligor or facility comes to light.

### C2.3     Requirement for process to update information

(1)     The bank must have a process to obtain and update relevant and material information in relation to–

    (a)     each obligor's financial condition; and

    (b)     facility characteristics that affect LGDs and EADs; and

    (c)     other characteristics that affect the assigned estimates of PD, LGD, and EAD.

(2)     The bank must also have a procedure for updating an obligor's rating in a timely fashion upon receipt of relevant and material information.

### C2.4     Requirement for annual review: retail IRB exposure class

The bank must, at least annually, review the loss characteristics and performance of each identified risk pool of exposures in the IRB retail exposure class.

## C3     Overrides

### C3.1     Control of model overrides

(1)     A bank must clearly document the situations in which a bank officer may override the outputs of the rating process on the basis of his or her expert judgement.

(2)     The documentation must specify which individuals have permission to carry out any such override, and the nature and extent to which they are permitted to override the outputs of the rating process.

(3)     The bank must have guidelines and processes in place for monitoring, individually, any case where–

    (a)     human judgement is used to override a model-based rating; or

    (b)     variables were excluded from a model; or

    (c)     inputs to a model were altered.

> *Guidance: Section B6.1 refers to the importance of human judgement and oversight in the models-based ratings process.*

## C4     Data maintenance

### C4.1     Application of subpart

(1)     Sections C4.2 to C4.5 apply to the corporate, sovereign, and bank IRB exposure classes.

(2)     Sections C4.2 and C4.6 apply to the retail IRB exposure class.

**C4.2    Data collection**

(1)    The bank must collect data on important characteristics of obligors and facilities, so as to–

    (a)    support the internal credit risk measurement and management process; and

    (b)    enable the requirements of this document to be met.

(2)    The data must contain sufficient detail to allow retrospective re-allocation of obligors and facilities to grades.

*Source: BS2B, para 4.247.*

**C4.3    Data maintenance (obligors)**

(1)    The bank must maintain a rating history of each obligor and eligible guarantor, and each history must include–

    (a)    the ratings assigned to a borrower/guarantor since that borrower/guarantor was first assigned an internal grade; and

    (b)    the dates the ratings were assigned; and

    (c)    the methodology and key data used to derive the rating; and

    (d)    the person/model responsible for making each assignment.

(2)    The bank must retain information on the identity of each obligor or facility that defaults, and on the timing and circumstances of such defaults.

(3)    In order to track the predictive power of the obligor rating system, the bank must also retain data on PD estimates, ratings migration, and realised default rates associated with obligor grades.

*Source: BS2B, para 4.248.*

**C4.4    Data maintenance (facilities)**

(1)    The bank must collect and store–

    (a)    a complete history of data on the LGD and EAD estimates associated with each of its facilities and, for each facility, the key data and methodology used to derive the estimate and the person or model responsible for making the estimate; and

    (b)    data on the estimated and realised LGDs and EADs associated with each defaulted facility.

(2)    If the bank reflects the credit risk mitigating effects of guarantees or credit derivatives through its LGD estimates, it must retain data on the LGD of the facility before and after evaluation of the effects of the guarantee/credit derivative.

(3)    The bank must retain information about the components of loss or recovery for each defaulted exposure, including the identity of the defaulting party.

> *Guidance: Examples of such information that a bank must retain include amounts recovered, the source of recovery (for example, collateral, liquidation proceeds, and guarantees), the time period required for recovery, and the administrative costs incurred by the bank as a result.*

*Source: BS2B, para 4.249.*

**C4.5    Supervisory slotting approach**

If a bank uses the supervisory slotting approach for corporate SL exposures, the bank must retain relevant data, including data on realised losses.

*Source: BS2B, para 4.250.*

**C4.6    Data maintenance (retail exposures)**

(1)    The bank must retain data–

(a)    used in the process of allocating retail exposures to pools; and

> *Guidance: Such data may include data on borrower and transaction risk characteristics used either directly or through use of a model, as well as data on delinquency.*

(b)    on the estimated PDs, LGDs, and EADs associated with its pools of retail exposures.

(2)    For defaulted exposures, the bank must retain data on the pools to which the exposure was assigned over the year prior to default and on the realised outcomes for LGD and EAD.

*Source: BS2B, para 4.251.*

# C5    Stress tests used in assessment of capital adequacy

**C5.1    Stress testing processes**

(1)    The bank must have in place sound stress testing processes for use in the assessment of capital adequacy.

(2)    The bank's stress testing must involve identifying possible events or future changes in economic conditions that could have unfavourable effects on credit exposures and on the assessment of the bank's ability to withstand such changes.

> *Guidance: Examples of scenarios that could be used are–*
> *(a)    economic or industry downturns.*
> *(b)    market-risk events.*
> *(c)    adverse liquidity conditions.*

(3)    The bank must perform one or more credit risk stress tests annually to assess the effects of certain specific scenarios on its regulatory capital position. The tests must be meaningful and reasonably conservative.

(4)    Whatever stress-testing method is used, as part of any stress test the bank must consider the effects on its regulatory capital position of credit impairment losses, and of a deterioration in the credit quality of its obligors and migration across rating grades.

(5)    The bank must consider the following sources of information in undertaking each stress test:

(a)    the bank's current and historical data on its own credit exposures; and

(b)    relevant external data, for example, historical credit losses in other banks and countries, and migrations in external ratings during previous credit stress events.

> *Guidance: To use evidence from the migration of external ratings in assessing its capital adequacy, a bank would need to broadly map its internal risk buckets to external rating categories.*

*Source: BS2B, paras 4.252 to 4.254; and new text.*

# Part D: Corporate governance and oversight

## D1     Corporate governance

### D1.1     Board responsibilities

(1)     All material aspects of the rating and estimation processes must be approved by the bank's board of directors.

(2)     The board must be notified of material changes or exceptions from established policies that will materially affect the operations of the rating system.

(3)     The board must be confident that the bank's senior management complies with the requirements of section D1.2.

*Source: BS2B, para 4.255.*

### D1.2     Senior management responsibilities

(1)     Senior management must approve any material differences between established procedures and actual practice.

(2)     Senior management must ensure, on an ongoing basis, that the rating system operates properly.

(3)     Senior management and staff in the bank's credit control function must regularly assess–

    (a)     the performance of the rating process; and

    (b)     areas needing improvement; and

    (c)     the status of efforts to improve previously identified deficiencies.

*Source: BS2B, para 4.256.*

### D1.3     Internal reporting requirements

(1)     Internal ratings must be an essential part of reporting to the board of directors and senior management.

(2)     Reporting must include–

    (a)     risk profile by grade; and

    (b)     migration across grades; and

    (c)     estimation of the relevant parameters per grade; and

    (d)     comparison of realised default rates, LGD, and EAD, against the relevant estimates from the bank's internal models.

*Source: BS2B, para 4.257.*

## D2     Credit risk control

### D2.1     Credit risk control unit

(1)     The bank must have an independent credit risk control unit that is responsible for the design or selection, implementation, and performance of the bank's internal rating systems.

(2)     The unit must be–

  (a)  functionally independent from the personnel and management functions responsible for originating exposures; and

  (b)  be responsible for–

    (i)  testing and monitoring internal grades; and

    (ii)  production and analysis of summary reports from the rating system, which must include historical default data sorted by rating at the time of default and one year prior to default, grade migration analyses, and monitoring of trends in key rating criteria; and

    (iii)  implementing procedures to verify that rating definitions are consistently applied across departments and geographic areas; and

    (iv)  reviewing and documenting any changes to the rating process, including the reasons for those changes; and

    (v)  reviewing whether the rating criteria remain predictive of risk.

(3)  The unit must document changes to the rating process, rating criteria, or individual rating parameters and retain that documentation.

*Source: BS2B, para 4.258.*

## D3  Audit of rating system

### D3.1  Annual audit or review

(1)  Internal or external audit, or an equally independent function, must–

  (a)  review, at least annually, the bank's rating system and its operations; and

  (b)  document their findings.

(2)  The review must address the operations of the credit function and the estimation of PD, LGD, and EAD.

(3)  The review must include consideration of whether all applicable minimum requirements have been met.

*Source: BS2B, para 4.259.*

# Part E: Risk quantification

## E1    Overall requirements for estimation

### E1.1    Introduction

This subpart sets out the broad requirements for internal estimates of PD, LGD, and EAD, and refers to the later subparts of Part E, which provide more detailed requirements for each of the parameters referred to in this subpart.

*Source: BS2B, para 4.262 (subpara 1).*

### E1.2    Estimation of PD

(1)    A bank must estimate PD for each internal obligor grade for corporate, sovereign, and bank exposures, and for each pool of retail exposures.

(2)    However, the bank is not required to produce its own estimates of PD for exposures within the corporate SL sub-classes for which the bank uses the supervisory slotting approach.

(3)    The PD estimate for an obligor grade must be the long-run average of one-year default rates for obligors in the grade, except in the case of retail exposures, for which the definition of default may be applied at the facility level rather than at the obligor level, in accordance with section E2.4.

(4)    Requirements that are specific to PD estimation are set out in Part E5.

*Source: BS2B, paras 4.262 (subpara 2) and 4.263 (part).*

### E1.3    Estimation of LGD and EAD

(1)    The bank must estimate an appropriate long-run default-weighted LGD for each corporate, sovereign, or bank exposure, and for each retail pool, as specified in Part E6.

(2)    The bank must estimate an appropriate long-run default-weighted average EAD for each corporate, sovereign, or bank exposure, and for each retail pool, as specified in Part E7.

*Source: BS2B, para 4.263 (remainder).*

### E1.4    Drivers of internal estimates of PD, LGD, and EAD

(1)    A bank deriving internal estimates of PD, LGD, and EAD must incorporate all relevant, material, and available data, information, and methods.

(2)    The bank may use both internal and external data for estimation.

(3)    The bank must ensure that the resulting estimates are representative of long-run default and loss experience.

(4)    The bank must base estimates on historical experience and empirical evidence, rather than purely on subjective or judgemental considerations.

(5)    The bank must update its estimation methods over time, as needed to reflect–

    (a)    any changes in its lending or collection practices; and

    (b)    the implications of technical advances and new data and other information, as those become available.

(6)     The bank must review its estimates and methods for estimation at least annually.

*Source: BS2B, paras 4.264 and 4.265.*

**E1.5    Sample data anchored to actual conditions**

(1)     The economic or market conditions underlying the data used for estimation must be relevant to current and reasonably conceivable future conditions.

(2)     The population of exposures in the sample used for estimation, and the lending standards and other relevant characteristics of the lending process that were in use when the data were generated, must closely match, or at least be comparable with, the bank's current exposures or lending standards, as the case may be.

(3)     There must be sufficient data, in terms of both number of exposures and length of sample period, to provide confidence in the accuracy and robustness of estimates of LGD and EAD.

(4)     The estimation technique must perform well in out-of-sample tests.

*Source: BS2B, para 4.266.*

**E1.6    Conservative approach**

Because estimates of PD, LGD, and EAD involve unpredictable errors, a bank must add a margin of conservatism to its estimates that is proportionate to the likely range of errors.

*Source: BS2B, para 4.267.*

## E2      Definition of default

**E2.1    Use of reference definition of default**

(1)     Sections E2.2 to E2.5 set out a reference definition of "default", which a bank must use for all credit exposures within its IRB exposure classes.

(2)     The bank must record an actual default on any exposure within any of its IRB exposure classes using this reference definition of default.

(3)     The bank must also use the reference definition of default to estimate PD, LGD, and EAD across all of its IRB exposure classes.

(4)     For the purpose of subsection (3), the bank–

(a)     may, subject to the requirements set out in section E5.4, use external data that are inconsistent with the reference definition of default; but

(b)     must adjust the data to achieve broad equivalence with the reference definition of default.

*Source: BS2B, para 4.271.*

**E2.2    Reference definition of default**

(1)     A default is considered to have occurred with regard to a particular obligor when one or both of the two following events have taken place:

(a)     the bank considers that the obligor is unlikely to pay its credit obligations in full, without recourse by the bank to actions such as realising any security:

(b)      the obligor is past due more than 90 days on a material credit obligation.

(2)      For the purposes of subsection (1)(b),–

(a)      an overdraft is taken as being past due once the customer has breached an advised limit, or has been advised of a limit smaller than current outstandings; and

(b)      the 90 days may be measured either as 90 calendar days past due or as 90 days' worth of contractual payments past due.

*Source: BS2B, para 4.268.*

### E2.3    Indicators of payment being unlikely

For the purpose of subsection E2.2(1)(a), indications that payment is unlikely include one or more of the following:

(a)      the bank has put the credit obligation on non-accrual status:

(b)      the bank has made a charge-off or account-specific allowance for impairment that results from a significant perceived decline in credit quality:

(c)      the bank has sold the credit obligation at a material credit-related economic loss:

(d)      the bank has consented to a distressed restructuring of the credit obligation, which is likely to result in a diminished financial obligation:

(e)      the bank has filed for the obligor's bankruptcy, statutory management, liquidation, voluntary administration, or has taken other similar action, in respect of the obligor's credit obligation:

(f)      the obligor is insolvent, bankrupt, or has been placed in statutory management, liquidation, voluntary administration, or any similar arrangement that would have the effect of preventing or delaying repayment of the credit obligation.

*Source: BS2B, para 4.269.*

### E2.4    Default on retail exposures

(1)      For retail exposures, a bank may apply the definition of default at the level of a particular facility, rather than at the level of the obligor.

(2)      In that case, default by an obligor on one obligation would not require the bank to treat all of that obligor's other obligations to the bank (or to any other member of the banking group) as defaulted.

*Source: BS2B, para 4.270.*

### E2.5    Previously defaulted or renegotiated facilities

(1)      If the status of a previously defaulted exposure is such that no trigger of the reference definition of default still applies, and if subsection (2) does not apply, the bank may treat the exposure as a non-defaulted facility.

(2)      The bank must not re-rate a renegotiated or otherwise modified item to a non-defaulted grade or rating until the item has operated in accordance with non-concessional terms and conditions for a period of at least six months.

*Source: BS2B, para 4.272.*

## E3    Re-ageing

### E3.1    Re-ageing documentation and policy

(1)    The bank must have clearly documented policies in place to determine when an exposure becomes classified as defaulted.

(2)    This applies particularly to the re-ageing of facilities and to the granting of extensions, deferrals, renewals, and rewrites to existing accounts.

(3)    At a minimum, the re-ageing policy must include–

    (a)    approval authorities and reporting requirements; and

    (b)    minimum age of a facility before it is eligible for re-ageing; and

    (c)    delinquency levels of facilities that are eligible for re-ageing; and

    (d)    maximum number of re-ageings per facility; and

    (e)    a reassessment of the obligor's capacity to repay.

(4)    The policy must be applied consistently over time, and its application must meet the requirements of section A1.3.

*Source: BS2B, para 4.273.*

### E3.2    Re-ageing and renegotiated items

The bank must not re-age a renegotiated item (*see* section E2.5) until the item has performed in accordance with non-concessional terms and conditions for a period of at least six months.

*Source: BS2B, para 4.273.*

## E4    Overdrafts

### E4.1    Treatment of overdrafts

A bank must, in relation to overdrafts,–

    (a)    ensure that authorised overdrafts are subject to a credit limit; and

    (b)    bring that credit limit to the client's attention; and

    (c)    monitor any breach of the credit limit.

> *Guidance: The bank must treat an overdraft as defaulted if its credit limit has been breached and the balance is not brought within the limit after 90 days (see subpart E2).*

*Source: BS2B, para 4.274.*

# E5 Risk quantification requirements specific to PD estimation

## E5.1 Application of subpart

(1) Sections E5.2 to E5.6 apply to the corporate, sovereign, and bank IRB exposure classes.

(2) Sections E5.7 to E5.10 apply to the retail IRB exposure class.

## E5.2 Combining techniques for adjusting PD: corporate, sovereign, and bank

(1) For estimating the average PD for each rating grade, the bank may emphasise a primary technique and use other techniques for comparison and as a basis for any adjustment.

(2) However, the bank must not rely on the mechanical application of a technique without supporting analysis.

(3) The bank must use judgement, where appropriate, in combining the results of different techniques, and in making adjustments for the limitations both of mechanical risk quantification techniques and of the information used.

> *Guidance: Examples of the techniques available to a bank, and the conditions applying to the use of those techniques, are set out in this subpart.*

*Source: BS2B, para 4.276 (subpara (1)).*

## E5.3 Internal default experience: corporate, sovereign, and bank

(1) A bank may estimate PD using data on its own default experience, but those estimates must reflect underwriting standards and any differences between the rating system that generated the data and the current rating system.

(2) Where only limited data are available, or where the bank's underwriting standards or rating systems have changed, the bank must add an appropriate margin of conservatism to its estimation of PD.

(3) The bank may also estimate PD using data pooled across other banks that have internal rating systems and criteria similar to its own.

*Source: BS2B, para 4.277.*

## E5.4 Mapping to external data: corporate, sovereign, and bank

(1) The bank may associate its internal grades with the scale used by an external credit rating agency, or may map its internal grades to that scale and then, in either case, attribute the observed default rates for the rating agency's grades to its internal grades.

(2) The bank must–

    (a) document such mapping, and must base that mapping on comparisons between–

        (i) the bank's internal rating criteria and those of the rating agency; and

        (ii) the default definitions used internally and those used by the rating agency; and

        (iii)      the internal and external ratings of any obligors common to the bank's data and the external institution's data.

    (b)      avoid biases or inconsistencies in the mapping approach or underlying data.

(3)      The external institution's rating criteria underlying the data must reflect the risk of obligors and not the transaction characteristics.

*Source: BS2B, para 4.278.*


### E5.5    Statistical default models: corporate, sovereign, and bank

(1)      The bank may, where estimates are drawn from statistical default prediction models, use a simple average of default-probability estimates for individual obligors in a given grade.

(2)      The use of default probability models for this purpose must meet the requirements in Part B6.

*Source: BS2B, para 4.279.*


### E5.6    Estimation based on long-run experience: corporate, sovereign, and bank

(1)      Estimation of the average PD for each rating grade must use information and techniques that take appropriate account of long-run experience.

(2)      Whatever combination of internal, external, and pooled data the bank uses for its PD quantification procedure, the bank must use at least one data source for which at least five years of observations are available.

(3)      If relevant and material data are available for any source over a period that is longer than five years, that longer time period must be used.

*Source: BS2B, paras 4.275 and 4.276 (subpara 2).*


### E5.7    Internal data primary source of information: retail IRB exposure class

(1)      Internal data should generally be the primary source of information for estimating loss characteristics for retail exposures.

(2)      External data or statistical models may also be used where there is evidence of a reliable relationship between the loss characteristics of the bank's portfolio and those of the external data or model.

(3)      All relevant and material data sources must be used as points of comparison.

*Source: BS2B, para 4.280.*


### E5.8    Use of estimate of expected long-run loss rate in PD and LGD estimates: retail IRB exposure class

(1)      For retail exposures, the bank may use an estimate of the expected long-run loss rate to derive estimates of PD and estimates of LGD (*see* section E6.3(2)).

(2)      In particular,–

    (a)      an appropriate PD estimate may be used to infer the long-run default-weighted average LGD; or

(b)      a long-run default-weighted average LGD may be used to infer the appropriate PD.

(3)      In either case, the LGD used for the IRB capital calculation must–

(a)      be greater than, or equal to, the long-run default-weighted average LGD; and

(b)      be consistent with the concepts defined in subpart E6.

*Source: BS2B, para 4.281.*

### E5.9    At least five years' observations for at least one data source: retail IRB exposure class

(1)      Whatever combination of internal, external, and pooled data the bank uses for its estimation of loss characteristics, the length of the underlying historical observation period used must be at least five years.

(2)      If relevant and material data are available for any source over a period that is longer than five years, that longer time period must be used.

(3)      Greater weight may be given to more recent data (and commensurately less weight to less recent data) where more recent data better predict loss rates.

*Source: BS2B, para 4.282.*

### E5.10    Seasoning effects on long-term retail exposures: retail IRB exposure class

(1)      Long-term retail exposures may be characterised by seasoning effects that peak several years after origination.

(2)      In the face of growth in exposures, the bank must take steps to ensure that–

(a)      estimation techniques remain accurate; and

(b)      the current capital level and earnings and funding prospects are sufficient for future capital needs.

(3)      PD estimates must be adjusted upward (in a consistent manner over time) to anticipate seasoning effects.

*Source: BS2B, para 4.283.*

## E6    Risk quantification requirements specific to internal LGD estimates

### E6.1    Application of subpart

(1)      Sections E6.2 to E6.6 apply to all exposure classes.

(2)      Section E6.7 applies only to the corporate, sovereign, and bank IRB exposure classes.

(3)      Sections E6.8 applies only to the retail IRB exposure class.

### E6.2    Meaning of loss for LGD purposes

(1)      For the purposes of estimating LGD, "loss" means economic loss.

(2)    When measuring economic loss, the bank must take into account all relevant factors, including material discount effects and material direct and indirect costs associated with collecting on the exposure.

(3)    The bank must not measure loss simply as the loss recorded in accounting records, although the bank must be able to reconcile accounting and economic losses.

(4)    The bank must reflect its own workout and collection expertise in its LGD estimates, and adjustments to estimates for such expertise must be conservative until the bank has sufficient internal empirical evidence of the impact of the degree of expertise.

> *Guidance: Subsection (4) recognises that a bank's degree of expertise in workout and recovery can significantly influence recovery rates.*

*Source: BS2B, para 4.284.*

### E6.3    LGD estimate to reflect economic downturns

(1)    The bank must estimate LGD for each facility in a way that reflects economic downturn conditions, in order to capture relevant risks.

(2)    Estimated LGD must be no less than the long-run default-weighted average rate of loss given default that is calculated using the average economic loss for all observed defaults within the data source for the given type of facility.

(3)    In estimating LGD, the bank must also account for the possibility that LGD of a facility could be higher than the default-weighted average during periods of higher than average credit losses, including variations in LGD over the business cycle.

> *Guidance: For this purpose, banks may use averages of loss severities observed during periods of high credit losses, forecasts based on appropriately conservative assumptions, or other similar methods.*

(4)    If the bank has approval to use its own estimates of LGD for residential mortgage exposures, the bank must assume that the downturn conditions include a fall in average house prices of 30 per cent.

*Source: BS2B, para 4.285.*

### E6.4    Collateral with correlated risk or currency mismatch

Where a bank holds collateral against an exposure, it must estimate LGD in a way that reflects, with an appropriate degree of conservatism,–

(a)    any significant interdependence between the risk of the obligor and that of the collateral or collateral provider; and

(b)    any currency mismatch between the underlying obligation and the collateral.

*Source: BS2B, para 4.286.*

### E6.5    Collateral management

(1)    In estimating LGD, a bank must have regard to historical recovery rates and must not base its LGD estimates solely on the estimated market value of the relevant collateral.

(2)    If the bank's LGD estimates reflect the existence of collateral, the bank must have internal processes and operational procedures in place for collateral management

and associated risk-management that are consistent with those required for the standardised treatment of collateral (*see* sections A2.3 and B1.3 of BPR132).

*Source: BS2B, para 4.287.*

### E6.6 LGD estimates for defaulted exposure

(1) The LGD estimate for a defaulted exposure should reflect the risk of additional, unexpected losses (**UL**), during the recovery period.

(2) The estimate of expected loss (**EL**) on a defaulted exposure must be based on current economic circumstances and facility status, as specified in Part F of BPR133.

(3) The bank must set the capital requirement for a defaulted exposure on a risk-sensitive basis and, for that purpose, the capital requirement (**K**) is equal to any excess of LGD over the best estimate of expected loss, as provided for in sections C8.3 and D6.4 of BPR133.

(4) The bank must carry out analysis to justify any case in which the best estimate of EL on a defaulted exposure is less than the sum of allowances for impairment and partial charge-offs on that exposure.

*Source: BS2B, para 4.288.*

### E6.7 Data observation period: additional standards for corporate, sovereign, and bank

(1) A bank's estimates of LGD must be based on a data observation period that covers at least one complete economic cycle where possible, and in any event must be for a period of at least seven years from at least one data source.

(2) If relevant and material data are available over a longer period for any source, that longer period must be used.

*Source: BS2B, para 4.289.*

### E6.8 Data observation period: additional standards for retail IRB exposure class

(1) Estimates of LGD for retail exposures must be based on at least five years of data observations.

(2) The less data the bank has available, the more conservative the estimation must be.

(3) Greater weight may be given to more recent data (and commensurately less weight to less recent data) where more recent data better predict loss rates.

*Source: BS2B, para 4.290.*

## E7 Risk quantification requirements specific to internal EAD estimates

### E7.1 Application of subpart

(1) Sections E7.2 to E7.7 apply to all exposure classes.

(2) Section E7.8 applies only to the corporate, sovereign, and bank IRB exposure classes.

(3) Sections E7.9 applies only to the retail IRB exposure class.

### E7.2 Meaning of EAD

EAD means the expected gross exposure of the facility on default of the obligor (that is, the amount legally owed to the bank by the defaulting obligor).

> *Guidance: This definition applies to both on-balance sheet items and off-balance sheet items.*

*Source: BS2B, para 4.291 (subpara 1).*

### E7.3 EAD estimates for on-balance sheet items

(1) For on-balance sheet items, the bank must estimate EAD as no less than the current drawn amount, subject to recognising the effects of on-balance sheet netting using the method set out in Part C of BPR132.

(2) The minimum requirements for the recognition of on-balance-sheet netting under the IRB approach are the same as under the standardised approach (*see* Part C of BPR132).

*Source: BS2B, para 4.291 (subpara 2).*

### E7.4 EAD estimates for counterparty credit risk exposures

For transactions that expose the bank to counterparty credit risk, the bank must calculate EAD using the standardised supervisory methodology for CEA, as provided for in Part E of BPR131.

> *Guidance: Given sections E7.3 and E7.4, the main focus of the minimum requirements for EAD estimation under the IRB approach, as set out in the rest of Part E7, is on off-balance sheet items other than counterparty credit risk on derivatives and SFTs, for example, commitments and guarantees.*

*Source: New text.*

### E7.5 EAD estimates for other off-balance sheet items

(1) The bank must have established procedures in place for estimating EAD for off-balance sheet items, and these procedures must specify the estimates of EAD to be used for each facility type.

(2) EAD estimates must–

(a) reflect the possibility of additional drawings by the obligor up to the time a default event is triggered; and

(b) account for the possibility of additional drawings after default, if the bank does not include the possibility of such drawings in its LGD estimates.

(3)     Where estimates of EAD differ by facility type, the definitions of the different facility types must provide clear and unambiguous boundaries between them.

(4)     The bank must assign an estimate of EAD to each facility, and that estimate must–

    (a)     be an estimate of the long-run default-weighted average EAD for similar facilities and obligors over a sufficiently long period of time; and

    (b)     incorporate a margin of conservatism reflecting the likely range of errors in the estimate.

(5)     Where EAD estimates for an exposure vary over the business cycle, the bank must use an EAD estimate that is appropriate for an economic downturn if that would be more conservative than the long-run average.

*Source: BS2B, paras 4.291(subpara 3) and 4.292.*

### E7.6     Criteria for EAD estimates

(1)     The bank must derive EAD estimates from criteria that are plausible and intuitive, and represent what the bank believes to be the material drivers of EAD, and the bank's choice of criteria must be supported by credible internal analysis.

(2)     The bank must be able to produce information about the factors driving its EAD experience, and a breakdown of how those factors contribute to EAD.

(3)     The bank must–

    (a)     use all relevant and material information in the derivation of its EAD estimates; and

    (b)     review those estimates–

        (i)     when material new information comes to light; and

        (ii)     in all cases, at least annually.

*Source: BS2B, para 4.293.*

### E7.7     EAD based on current and potential drawings

(1)     The bank's estimation of EAD must give due consideration to the policies and strategies it has in place in relation to account monitoring and payment processing.

(2)     The bank must take into account its ability and willingness to prevent further drawings in circumstances short of payment default.

(3)     The bank must have adequate systems and procedures in place to monitor facility amounts, current outstandings against committed lines, and changes in outstandings for each obligor and each grade.

(4)     The bank must be able to monitor outstanding balances daily.

*Source: BS2B, para 4.294.*

### E7.8     Data observation period: additional standards for corporate, sovereign, and bank

(1)     The bank must base its estimate of EAD on a time period that covers a complete economic cycle, where possible, and is in all cases no less than seven years.

(2)     If relevant and material data are available over a longer period from any source, that longer period must be used.

(3)   The bank must calculate an EAD estimate using a default-weighted average, rather than a time-weighted average.

### E7.9   Data observation period: additional standards for retail IRB exposure class

(1)   EAD estimates for retail exposures must be based on data observations over at least five years.

(2)   The less data that are available, the more conservative the estimates should be.

(3)   Greater weight may be given to more recent data (and commensurately less weight to less recent data) where more recent data better predict drawdowns.

## E8   Operational requirements for purchased receivables

### E8.1   Overview

(1)   When purchasing receivables, the bank must be satisfied that current and future advances can be repaid from the liquidation of, or collections against, the receivables pool.

(2)   A receivables pool will qualify for the top-down treatment of credit risk only if the bank closely monitors and controls the pool and the overall lending relationship.

(3)   This subpart sets out specific operational requirements that the bank must meet in order to satisfy the conditions in subsections (1) and (2).

### E8.2   Legal certainty

(1)   The bank must ensure that the facility under which the receivables are purchased is structured in manner that gives the bank effective ownership and control of the cash remittances from the receivables under all foreseeable circumstances, including incidences of seller or servicer distress and insolvency.

(2)   When the obligor makes payments directly to a seller or servicer, there must be regular verification that payments are forwarded completely and within the contractually agreed terms.

(3)   Ownership over the receivables and cash receipts must be protected against legal challenges or moratoria that could inhibit or materially delay the bank's ability to liquidate or assign the receivables, or retain control over cash receipts.

### E8.3   Effectiveness of monitoring systems

(1)   The bank must be able to monitor both the quality of the receivables and the financial condition of the seller and servicer.

(2)   In particular, the bank must–

(a)   assess the correlation between the quality of the receivables and the financial conditions of both the seller and the servicer; and

(b) have internal policies and procedures that adequately safeguard against the existence of such correlation and assign an internal risk rating to each seller and servicer; and

(c) have clear and effective policies and procedures for determining seller and servicer eligibility, and either the bank or its agent must conduct and document periodic reviews of sellers and servicers, to–

(i) verify the accuracy of reports from the seller/servicer; and

(ii) detect fraud or operational weaknesses; and

(iii) verify the quality of the seller's credit policies and servicer's collection policies and procedures; and

(d) have the ability to assess the characteristics of the receivables pool, including–

(i) over-advances; and

(ii) history of the seller's arrears, bad debts, and bad debt allowances; and

(iii) payment terms; and

(iv) potential contra accounts; and

(e) have effective policies and procedures for monitoring, on an aggregate basis, single-obligor concentrations both within and across receivables pools; and

(f) receive timely and sufficiently detailed reports of receivables ageings and dilutions, to–

(i) ensure compliance with the bank's eligibility criteria and advancing policies governing purchased receivables; and

(ii) provide an effective means of monitoring and confirming the seller's terms of sale and dilution.

*Source: BS2B, Nov 2015, para 4.305.*

### E8.4 Effectiveness of work-out systems

(1) The bank must have systems and procedures for–

(a) detecting deterioration in the seller's financial condition at an early stage; and

(b) detecting deterioration in the quality of the receivables at an early stage; and

(c) addressing emerging problems pro-actively.

(2) In particular, the bank must have–

(a) clear and effective policies, procedures, and information systems to monitor compliance with–

(i) all contractual terms of the facility (including, for example, covenants, advancing formulas, concentration limits, and early amortisation triggers); and

(ii) the internal policies governing advance rates and receivables eligibility; and

(b)     systems that track covenant violations and waivers as well as exceptions to established policies and procedures; and

(c)     effective policies and procedures for detecting, approving, monitoring, and correcting over-advances, so as to limit inappropriate draw-downs.

(3)     The bank must also have effective policies and procedures in place for dealing with financially weakened sellers or servicers and/or deterioration in the quality of receivable pools.

(4)     The policies and procedures referred to in subsection (3) include, but are not limited to,–

(a)     early termination triggers in revolving facilities and other covenant protections; and

(b)     a structured and disciplined approach to dealing with covenant violations; and

(c)     clear and effective policies and procedures for initiating legal actions and dealing with problem receivables.

*Source: BS2B, para 4.306.*

### E8.5     Effectiveness of systems for controlling collateral, credit availability, and cash

(1)     The bank must have clear and effective policies and procedures in place governing the control of receivables, credit, and cash.

(2)     In particular, the bank must meet the following requirements:

(a)     written internal policies must specify all material elements of the receivables purchase programme, including–

(i)     the advance rates; and

(ii)    eligible collateral; and

(iii)   necessary documentation; and

(iv)    concentration limits; and

(v)     how cash receipts are to be handled; and

(b)     the elements identified in paragraph (a) must take appropriate account of all relevant and material factors, including–

(i)     the seller's/servicer's financial condition; and

(ii)    risk concentrations; and

(iii)   trends in the quality of the receivables and the seller's customer base; and

(c)     internal systems must ensure that funds are advanced only against specified supporting collateral and documentation.

> *Guidance: This may include, for example, servicer attestations, invoices, and shipping documents.*

*Source: BS2B, para 4.307.*

**E8.6    Compliance with bank's internal policies and procedures**

(1)     The bank must have internal process in place for assessing compliance with all critical policies and procedures in relation to the bank's receivables purchasing programme.

(2)     The process must include–

(a)     regular internal and/or external audits of all critical phases of the programme; and

(b)     verification of the separation of duties–

(i)     between the assessment of the seller/servicer and the assessment of the obligor; and

(ii)    between the assessment of the seller/servicer and the field audit of the seller/servicer; and

(c)     evaluations of back office operations, with particular focus on qualifications, experience, staffing levels, and supporting systems.

*Source: BS2B, para 4.308.*

# Part F: Validation of internal estimates

## F1    Requirements for validation

### F1.1    Accuracy and consistency of rating system to be validated

(1)    The bank must have a robust system in place to validate the accuracy and consistency of its rating systems, processes, and estimation of all relevant risk components.

(2)    The bank's internal validation process must enable it to assess the performance of its internal rating and risk estimation systems in a consistent manner.

*Source: BS2B, para 4.309.*

### F1.2    Comparison of estimates with outcomes

(1)    The bank must–

    (a)    regularly compare realised default rates with the estimated PD for each obligor grade; and

    (b)    carry out analogous analysis for its LGD and EAD estimates.

(2)    The comparisons referred to in subsection (1) must use the longest period of historical data possible.

(3)    The methods and data used for the comparisons must be clearly documented, and the analysis and documentation must be updated at least annually.

*Source: BS2B, para 4.310.*

### F1.3    Quantitative validation and testing

(1)    In addition to the requirements of section F1.2, the bank must use other quantitative validation tools, and use comparisons with relevant external data sources.

(2)    The data used must be appropriate to the portfolio, must be updated regularly, and must cover a relevant observation period.

(3)    The bank's internal assessments of the performance of its rating systems must be based on long data histories that cover a range of economic conditions and, where possible, one or more complete business cycles.

(4)    Quantitative testing methods and other validation methods must not vary systematically with the economic cycle, and any changes to the methods and data used must be clearly documented.

*Source: BS2B, paras 4.311 and 4.312.*

### F1.4    Deviations from estimates

(1)    The bank must have documented internal standards for dealing with situations where realised PD, LGD, and EAD deviate from estimates by enough to call into question the validity of the estimates.

(2)    The standards must take account of systematic variability in default experiences (including, but not limited to, variability associated with the business cycle).

(3)    Where realised values continue to be higher than the bank's estimates, the estimates must be revised upward to reflect the default and loss experience.

*Source: BS2B, paras 4.313 and 4.314.*