Chapter 4

The IRB approach

4

4.3 The IRB approach: Provisions common to different exposure classes

Application

4.3.1 R This section applies to all *exposures* treated under the *IRB approach*.

Exposure classes

4.3.2 R Each *exposure* must be assigned to one of the following *exposure* classes:

(1) claims or contingent claims on central governments and *central banks*;

(2) claims or contingent claims on *institutions*;

(3) claims or contingent claims on corporates;

(4) retail claims or contingent retail claims;

(5) equity claims;

(6) *securitisation* positions; and

(7) *non credit-obligation assets*.

[**Note**: *BCD* Article 86(1)]

4.3.3 R The methodology used by a *firm* for assigning *exposures* to different *IRB exposure classes* must be appropriate and consistent over time.

[**Note**: *BCD* Article 86(9)]

Calculation of risk weighted exposure amounts

4.3.4 R The *risk weighted exposure amounts* for credit risk for *exposures* belonging to one of the *exposure* classes referred to in (1) to (4) must, unless deducted from *capital resources*, be calculated in accordance with the following provisions:

(1) for *exposures* in the *sovereign, institution and corporate IRB exposure class*, BIPRU 4.4.57 R to BIPRU 4.4.60 R, BIPRU 4.4.79 R, BIPRU 4.5.8 R to BIPRU 4.5.10 R (for *specialised lending exposures*), BIPRU 4.9.3 R

and ■ BIPRU 4.8.16 R to ■ BIPRU 4.8.17 R (for purchased *corporate exposure* receivables);

(2) for *exposures* in the *retail exposure class*, ■ BIPRU 4.6.41 R to ■ BIPRU 4.6.44 R, ■ BIPRU 4.6.57 R and ■ BIPRU 4.8.18 R to ■ BIPRU 4.8.20 R (for purchased *retail exposure* receivables);

(3) for *exposures* in the *equity exposure class*, ■ BIPRU 4.7.5 R to ■ BIPRU 4.7.6 R, ■ BIPRU 4.7.9 R to ■ BIPRU 4.7.11 R, ■ BIPRU 4.7.14 R to ■ BIPRU 4.7.16 R and ■ BIPRU 4.7.24 R to ■ BIPRU 4.7.25 R; and

(4) for *exposures* in the *non credit-obligation assets exposure class*, ■ BIPRU 4.9.6 R.

[**Note**: *BCD* Article 87(1)]

4.3.5 R The calculation of *risk weighted exposure amounts* for credit risk and *dilution risk* must be based on the relevant parameters associated with the *exposure* in question. These include *probability of default* (*PD*), *loss given default* (*LGD*), maturity (M) and the *exposure* value of the *exposure*. *PD* and *LGD* may be considered separately or jointly, in accordance with the provisions relating to *PD* and *LGD* in ■ BIPRU 4.4, ■ BIPRU 4.6, ■ BIPRU 4.7 and ■ BIPRU 4.8 at:

(1) for *exposures* in the *sovereign, institution and corporate IRB exposure class*, ■ BIPRU 4.4.34 R - ■ BIPRU 4.4.35 R, ■ BIPRU 4.4.42 R to ■ BIPRU 4.4.43 R, ■ BIPRU 4.4.63 R - ■ BIPRU 4.4.66 R, ■ BIPRU 4.4.80 R and, for *PD* and *LGD* for *dilution risk* of purchased *corporate exposure* receivables, ■ BIPRU 4.8.23 Rand ■ BIPRU 4.8.26 R;

(2) for *exposures* in the *retail exposure class*, ■ BIPRU 4.6.50 R - ■ BIPRU 4.6.54 R, ■ BIPRU 4.6.58 R, and, for *PD* and *LGD* for *dilution risk* of purchased *retail exposure* receivables, ■ BIPRU 4.8.24 R and ■ BIPRU 4.8.27 R; and

(3) for *exposures* in the *equity exposure class*, ■ BIPRU 4.7.18 R and ■ BIPRU 4.7.20 R - ■ BIPRU 4.7.21 R.

[**Note**: *BCD* Article 87(3)]

Calculation of expected loss amounts

4.3.6 R The *expected loss* amounts for *exposures* belonging to one of the *IRB exposure classes* referred to in (1) to (3) must be calculated in accordance with the methods set out in the following provisions:

(1) for *exposures* in the *sovereign, institution and corporate IRB exposure class*, ■ BIPRU 4.4.61 R to ■ BIPRU 4.4.62 R and (for *specialised lending exposures*) ■ BIPRU 4.5.13 R to BIPRU 4.5.15R;

(2) for *exposures* in the *retail exposure class*, ■ BIPRU 4.6.47 R to ■ BIPRU 4.6.48 R;

(3) for *exposures* in the *equity exposure class*, ■ BIPRU 4.7.12 R, ■ BIPRU 4.7.17 R and ■ BIPRU 4.7.26 R; and

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(4) (for purchased receivables falling into one of the *IRB exposure classes* in (1) to (3)) BIPRU 4.8.30 R.

[**Note:** *BCD* Article 88(1)]

4.3.7 R The calculation of *expected loss* amounts in accordance with BIPRU 4.3.6 R must be based on the same input figures of *PD*, *LGD* and the *exposure* value for each *exposure* as being used for the calculation of *risk weighted exposure amounts* in accordance with BIPRU 4. For *defaulted exposures*,where a *firm* uses its own estimate of *LGDs*, *EL* must be the *firm*'s best estimate of expected loss (EL_{BE}), for the *defaulted exposure* in accordance with BIPRU 4.3.122 R.

[**Note:** *BCD* Article 88(2)]

Treatment of expected loss amounts

4.3.8 R The *expected loss* amounts calculated in accordance with BIPRU 4.3.6 R (1), BIPRU 4.3.6 R (2) and BIPRU 4.3.6 R (4) must be subtracted from the sum of value adjustments and provisions related to these *exposures*. Discounts on balance sheet *exposures* purchased when in *default* according to BIPRU 4.4.71 R must be treated in the same manner as value adjustments. *Expected loss* amounts for *securitised exposures* and value adjustments and provisions related to these *exposures* must not be included in this calculation.

[**Note:** *BCD* Annex VII Part 1 point 36]

Corporate governance

4.3.9 R All material aspects of the rating and estimation processes must be approved by the *firm's governing body* or a designated committee thereof and senior management. These parties must possess a general understanding of the *firm's rating systems* and detailed comprehension of its associated management reports.

[**Note**: *BCD* Annex VII Part 4 point 124]

4.3.10 G

(1) A *firm's governing body* or *designated committee* may choose to approve only material aspects of the *firm's rating systems* and material changes to the *firm's rating systems*.

(2) Where a *firm's governing body* or *designated committee* chooses to approve only material aspects of the *firm's rating systems* and material changes to the *firm's rating systems*:

(a) the *firm's governing body* or *designated committee* should define the *firm's* overall approach to material aspects of rating and estimation processes for all *rating systems*, including non-material *rating systems* and approve a policy statement defining that approach; and

(b) the *firm* should define and document the process for approval of non-material aspects of the *firm's rating systems*.

4.3.11 R Senior management must provide notice to the *governing body* or a designated committee thereof of material changes or exceptions from established policies that will materially impact the operations of the *firm*'s *rating systems*.

[**Note:** *BCD* Annex VII Part 4 point 125]

4.3.12 G Where the *firm's rating systems* are used on a unified basis for the *parent undertaking* and its *subsidiary undertakings* under BIPRU 4.2.3 R, and approval and reporting of the *ratings systems* are carried out at the group level, the governance requirements in BIPRU 4.3.9 R and BIPRU 4.3.11 R may be met if:

(1) the *subsidiary undertakings* have delegated to the *governing body* or *designated committee* of the *EEA parent institution* or *EEA parent financial holding company* responsibility for approval of the *firm*'s *rating systems*;

(2) the *governing body* or *designated committee* of the *EEA parent institution* or *EEA parent financial holding company* approves either:

(a) all aspects of the *firm*'s *rating systems*, and material changes; or

(b) all aspects of the *firm*'s *rating systems* that are material in the context of the group, and material changes to those, and a policy statement defining the overall approach to material aspects of rating and estimation processes for all *rating systems*, including non-material *rating systems*.

4.3.13 R Senior management must have a good understanding of the *rating system*'s designs and operations. Senior management must ensure on an ongoing basis that the *rating systems* are operating properly. Senior management must be regularly informed by the credit risk control units about the performance of the rating process, areas needing improvement, and the status of efforts to improve previously identified deficiencies.

[**Note:** *BCD* Annex VII Part 4 point 126]

4.3.14 R Internal ratings-based analysis of the *firm*'s credit risk profile must be an essential part of the management reporting required under BIPRU 4.3.9 R, BIPRU 4.3.11 R and BIPRU 4.3.13 R. Reporting must include at least risk profile by grade, migration across grades, estimation of the relevant parameters per grade, and comparison of realised *default* rates and, to the extent that own estimates are used, of realised *LGDs* and realised *conversion factors* against expectations and stress-test results. Reporting frequencies must depend on the significance and type of information and the level of the recipient.

[**Note:** *BCD* Annex VII Part 4 point 127]

Credit risk control

4.3.15 R The credit risk control unit must be independent from the personnel and management functions responsible for originating or renewing *exposures* and report directly to senior management. The unit must be responsible for the design or selection, implementation, oversight and performance of the *rating systems*. It must regularly produce and analyse reports on the output of the *rating systems*.

[**Note:** *BCD* Annex VII Part 4 point 128]

4.3.16 R The areas of responsibility for the credit risk control unit(s) must include the following:

(1) testing and monitoring grades and pools;

(2) production and analysis of summary reports from the *firm's rating systems*;

(3) implementing procedures to verify that grade and pool definitions are consistently applied across departments and geographic areas;

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

(5) reviewing the rating criteria to evaluate if they remain predictive of risk (and changes to the rating process, criteria or individual rating parameters must be documented and retained);

(6) active participation in the design or selection, implementation and validation of models used in the rating process;

(7) oversight and supervision of models used in the rating process; and

(8) ongoing review and alterations to models used in the rating process.

[**Note:** *BCD* Annex VII Part 4 point 129]

4.3.17 R Notwithstanding BIPRU 4.3.16 R, a *firm* using pooled data according to BIPRU 4.3.92 R - BIPRU 4.3.94 R (Overall requirements for estimation) may outsource the following tasks:

(1) production of information relevant to testing and monitoring grades and pools;

(2) production of summary reports from the *firm's rating systems*;

(3) production of information relevant to review of the rating criteria to evaluate if they remain predictive of risk;

(4) documentation of changes to the rating process, criteria or individual rating parameters; and

(5) production of information relevant to ongoing review and alterations to models used in the rating process.

[**Note:** *BCD* Annex VII Part 4 point 130 (part)]

4.3.18 R A *firm* making use of BIPRU 4.3.17 R must ensure that the *appropriate regulator* has access to all relevant information from the third party that is necessary for examining compliance with the *minimum IRB standards* and the *firm*'s *IRB permission* and that the *appropriate regulator* may perform on-site examinations to the same extent as within the *firm*.

[**Note:** *BCD* Annex VII Part 4 point 130 (part)]

Documentation of rating systems

4.3.19 R A *firm* must document the design and operational details of its *rating systems*. The documentation must evidence compliance with the *minimum IRB standards* and the *firm*'s *IRB permission*, and address topics including portfolio differentiation, rating criteria, responsibilities of parties that rate obligors and *exposures*, frequency of assignment reviews, and management oversight of the rating process.

[**Note:** *BCD* Annex VII Part 4 point 31]

4.3.20 R A *firm* must ensure that all documentation relating to its *rating systems* or otherwise required by the *rules* governing the *IRB approach* are stored, arranged and indexed in such a way that the *firm* would be able to make them all available to the *appropriate regulator*, or to make any class or description of them specified by the *appropriate regulator* available to the *appropriate regulator*, immediately on demand or within a short time thereafter.

4.3.21 R A *firm* must document the rationale for and analysis supporting its choice of rating criteria. A *firm* must document all major changes in the risk rating process, and such documentation must support identification of changes made to the risk rating process subsequent to the last review by the *appropriate regulator*. The organisation of rating assignment including the rating assignment process and the internal control structure must also be documented.

[**Note:** *BCD* Annex VII Part 4 point 32]

4.3.22 R A *firm* must document the specific definitions of default and loss used internally and demonstrate consistency with the definitions of *default* and *loss* set out in the *glossary* and BIPRU 4.

[**Note:** *BCD* Annex VII Part 4 point 33]

4.3.23 G A *firm*'s documentation relating to data should include clear identification of responsibility for data quality. A *firm* should set standards for data quality and aim to improve them over time. A *firm* should measure its performance against those standards. A *firm* should ensure that its data is of high enough quality to support its risk management processes and the calculation of its capital requirements.

4.3.24 R Where a *firm* employs statistical models in the rating process, the *firm* must document its methodologies. This material must:

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

(2) establish a rigorous statistical process (including out-of-time and out-of-sample performance tests) for validating the model; and

(3) indicate any circumstances under which the model does not work effectively.

[**Note:** *BCD* Annex VII Part 4 point 34]

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Rating systems

4.3.25 R A *rating system* comprises all of the methods, processes, controls, data collection and IT systems that support the assessment of credit risk, the assignment of *exposures* to grades or pools (rating), and the quantification of *default* and *loss* estimates for a certain type of *exposure*.

[**Note:** *BCD* Annex VII Part 4 point 1]

4.3.26 R If a *firm* uses multiple *rating systems*, the rationale for assigning an obligor or a transaction to a *rating system* must be documented and applied in a manner that appropriately reflects the level of risk.

[**Note:** *BCD* Annex VII Part 4 point 2]

4.3.27 R Assignment criteria and processes must be periodically reviewed to determine whether they remain appropriate for the current portfolio and external conditions.

[**Note:** *BCD* Annex VII Part 4 point 3]

4.3.28 R Where a *firm* uses direct estimates of risk parameters these may be seen as the outputs of grades on a continuous rating scale.

[**Note:** *BCD* Annex VII Part 4 point 4]

Validation of internal estimates

4.3.29 R A *firm* must have robust systems in place to validate the accuracy and consistency of *rating systems*, processes, and the estimation of all relevant risk parameters (*PD*, *LGD*, *conversion factors* and *EL*). A *firm* must be able to demonstrate to the *appropriate regulator* that the internal validation process enables it to assess the performance of internal rating and risk estimation systems consistently and meaningfully.

[**Note:** *BCD* Annex VII Part 4 point 110]

4.3.30 R

(1) A *firm* must validate its *rating systems*. Its validation process must include, as a minimum, the elements set out in (2) - (8).

(2) A *firm* must establish and define standards of objectivity, accuracy, stability and conservatism that it designs its *ratings systems* to meet. It must have processes that establish whether its *rating systems* meet those standards.

(3) A *firm* must establish and define standards of accuracy of calibration (i.e. whether outcomes are consistent with estimate) and

discriminative power (i.e. the ability to rank-order risk) that it designs its *rating systems* to meet. It must have processes that establish whether its *rating systems* meet those standards.

(4) A *firm* must have polices and standards that specify the actions to be taken when a *rating system* fails to meet the standards of accuracy and discriminative power referred to in (2) and (3).

(5) A *firm's* validation process must include a mix of developmental evidence, benchmarking and process verification. A *firm's* validation process must include policies on how this mixture varies between different *rating systems*.

(6) A *firm's* validation process must include the use of both quantitative and qualitative techniques.

(7) A *firm's* validation process must include policies on how validation procedures are expected to vary over time.

(8) A *firm's* validation process must include independent input into and review of its *rating systems*.

(9) The standards set under (2) and (3) must meet the *minimum IRB standards*.

(10) For the purpose of (5):

(a) developmental evidence means evidence that substantiates whether the logic and quality of a *rating system* (including the quantification process) adequately discriminates between different levels of, and delivers accurate estimates of *PD*, *EL*, *LGD* and *conversion factors* (as applicable); and

(b) process verification means the process of establishing whether the methods used in a *rating system* to discriminate between different levels of risk and to quantify *PD*, *EL*, *LGD* and *conversion factors* are being used, monitored and updated in the way intended in the design of the *rating system*.

4.3.31 G A *firm* should have regard to the involvement of management at an appropriately senior level in the validation process.

4.3.32 G The approach to validation may vary with the significance of the *exposures* covered by a *rating system*.

4.3.33 R A *firm* must regularly compare realised *default* rates with estimated *PDs* for each grade and where realised *default* rates are outside the expected range for that grade a *firm* must specifically analyse the reasons for the deviation. A *firm*using its own estimates of *LGDs* and/or *conversion factors* must also perform analogous analysis for own estimates of *LGDs* and *conversion factors*. Such comparisons must make use of historical data that cover as long a period as possible. A *firm* must document the methods and data used in such comparisons. This analysis and documentation must be updated at least annually.

[**Note:** *BCD* Annex VII Part 4 point 111]

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4.3.34 G

(1) This paragraph sets out *guidance* on assessing the adequacy of a *rating system*'s discriminative power (see BIPRU 4.3.30 R (3) on the meaning of discriminative power).

(2) A *firm* should be able to explain the performance of its *rating systems* against its chosen measure (or measures) of discriminative power. In making this comparison a *firm* should rely primarily on actual historic *default* experience where this is available. In particular, a *firm* should be able to explain:

(a) the extent of any potential inaccuracy in these measures, caused in particular by small sample size; and

(b) the potential for divergence in the future, whether caused by changing economic conditions or other factors.

(3) The assessment of discriminative power should include appropriate use of external benchmarks where available.

(4) The *appropriate regulator* will, in assessing the *firm*'s performance, take into consideration the sophistication of the measure of discrimination chosen.

(5) In the case of a portfolio for which there is insufficient *default* experience to provide any confidence in statistical measures of discriminative power a *firm* need not carry out the procedure in (2) and may instead use other methods. For example, it may make use of comparison with an external measurement approach by analysing whether the *firm*'s *rating systems* and the external approach rank common obligors in broadly similar ways. A *firm* should be able to explain the methodology it uses and the rationale for its use.

4.3.35 R

A *firm* must also use other appropriate quantitative validation tools and comparisons with relevant external data sources. The analysis must be based on data that is appropriate to the portfolio, is updated regularly, and covers a relevant observation period. A *firm*'s internal assessments of the performance of its *rating systems* must be based on as long a period as possible.

[**Note:** *BCD* Annex VII Part 4 point 112]

4.3.36 R

The methods and data used for quantitative validation must be consistent through time. Changes in estimation and validation methods and data (both data sources and periods covered) must be documented.

[**Note:** *BCD* Annex VII Part 4 point 113

4.3.37 R

A *firm* must have sound internal standards for situations where deviations in realised *PDs*, *LGDs*, *conversion factors* and, where *EL* is used, total *losses*, from expectations become significant enough to call the validity of the estimates into question. These standards must take account of business cycles and similar systematic variability in *default* and *loss* experience. Where realised values continue to be higher than expected values, a *firm* must revise estimates upward to reflect its *default* and *loss* experience.

[**Note:** *BCD* Annex VII Part 4 point 114]

Internal audit

4.3.38 R Internal audit or another comparable independent auditing unit must review at least annually the *firm's rating systems* and its operations, including the operations of the *firm* and the estimation of *PDs*, *LGDs*, *ELs* and *conversion factors*. Areas of review must include adherence to all applicable minimum requirements.

[**Note:** *BCD* Annex VII Part 4 point 131]

Stress tests used in assessment of capital adequacy

4.3.39 R A *firm* must have in place sound stress testing processes for use in the assessment of its capital adequacy. Stress testing must involve identifying possible events or future changes in economic conditions that could have unfavourable effects on the firm's credit *exposures* and assessment of the *firm's* ability to withstand such changes.

[**Note:** *BCD* Annex VII Part 4 point 40]

4.3.39A G The *appropriate regulator* expects that *firms* will routinely make use of stress testing and scenario analysis as a tool in the calibration and/or validation of their *IRB approach* parameters in order to increase the accuracy or, at least, the conservatism of the estimates. Stress testing should include a thorough exploration of various outturns different to the *firm's* normal expectations in order to give the *firm* a clear view of the potential for the forward-looking estimate to be different from that indicated by the primary data source(s). *Firms* should consider this as an integral part of their quantification process, and should have clear standards for how the results of the stress tests affect the final estimates used for the *IRB approach* parameters.

4.3.40 R

(1) A *firm* must regularly perform a credit risk stress test to assess the effect of certain specific conditions on its total capital requirements for credit risk. The test to be employed must be one chosen by the *firm*. The test to be employed must be meaningful and reasonably conservative. Stressed portfolios must contain the vast majority of a *firm's* total *exposures* covered by the *IRB approach*.

(2) The stress test must be designed to assess the *firm's* ability to meet its capital requirements for credit risk under GENPRU 2.1 during all stages of the economic cycle and during an economic downturn scenario based on forward looking hypothetical events calibrated against the most adverse movements in individual risk drivers experienced over a long historical period.

(3) In particular the stress test must address the impact (including by ratings migration) of changes in the credit quality of its credit risk counterparties including its protection providers. A *firm* using the treatment set out in BIPRU 4.4.79 R must in particular consider the impact of protection providers falling outside the eligibility criteria.

(4) The stress test must be conducted on the basis of the *firm's exposures* (on- and off-balance sheet) as they stand at the time of the stress test.

(5) The stress test must be carried out at least annually and also in the event of a significant change in the state of the economy.

(6) A *firm* need not assume that the recession referred to in (2) will occur in the 12 months immediately following the stress test. Instead, the stress test must incorporate a plausible time horizon for the occurrence of the cyclical deterioration of the severity tested for. A *firm* need not assume that the downturn will occur for all portfolios in all jurisdictions simultaneously.

[**Note:** *BCD* Annex VII Part 4 points 41 and 42]

4.3.41 G To the extent that the economic conditions assumed in the stress tests required under BIPRU 4.3.39 R or BIPRU 4.3.40 R coincide with the conditions assumed in the production of economic downturn *LGDs* (see BIPRU 4.3.103 R), the *LGDs* to be used might be expected to be similar.

4.3.42 G The requirement in BIPRU 4.3.40 R (2) is to identify, in a forward-looking manner, severe but plausible downturn conditions relevant to business lines and jurisdictions and to determine the likely impact of those conditions on a *firm*'s credit risk regulatory capital requirements. The description of the economic recession contained in BIPRU 4.3.40 R (2) should not be taken as stipulating one approach (e.g. statistical) over other approaches (e.g. scenario analysis) in the identification of the relevant recessionary circumstances.

Rating systems: Assignment to grades or pools

4.3.43 R A *firm* must have specific definitions, processes and criteria for assigning *exposures* to grades or pools within a *rating system*.

[**Note:** *BCD* Annex VII Part 4 point 17 (part)]

4.3.44 R The grade or pool definitions and criteria must be sufficiently detailed to allow those charged with assigning ratings consistently to assign obligors or facilities posing similar risk to the same grade or pool. This consistency must exist across lines of business, departments and geographic locations within each *rating system*.

[**Note:** *BCD* Annex VII Part 4 point 17 (part)]

4.3.45 G In meeting BIPRU 4.3.44 R a *firm* should have regard to its application to each *rating system*.

4.3.46 R The documentation of the rating process must allow third parties to understand the assignments of *exposures* to grades or pools, to replicate grade and pool assignments and to evaluate the appropriateness of the assignments to a grade or a pool.

[**Note:** *BCD* Annex VII Part 4 point 17 (part)]

4.3.47 R The criteria referred to in BIPRU 4.3.43 R must also be consistent with the *firm*'s internal lending standards and its policies for handling troubled obligors and facilities.

[**Note:** *BCD* Annex VII Part 4 point 17 (part)]

4.3.48 R A *firm* must take all relevant information into account in assigning obligors and facilities to grades or pools. Information must be current and must enable the *firm* to forecast the future performance of the *exposure*. The less information a *firm* has, the more conservative must be its assignments of *exposures* to obligor and *facility grades* or pools. If a *firm* uses an external rating as a primary factor determining an internal rating assignment, the *firm* must ensure that it considers other relevant information.

[**Note:** *BCD* Annex VII Part 4 point 18]

Rating systems: General governance

4.3.49 G

(1) This paragraph contains *guidance* on BIPRU 4.3.43 R and more general *guidance* about the governance of *rating systems*.

(2) In determining the assignment referred to in BIPRU 4.3.43 R, a *firm* should have regard to the sensitivity of the rating to movements in fundamental risk drivers.

(3) A *firm* should, for any *rating system*, be able to demonstrate that it acts appropriately or has an appropriate policy, as applicable, with respect to:

(a) any deficiencies caused by its not being sensitive to movements in fundamental risk drivers or for any other reason;

(b) periodic review and action in the light of such review;

(c) provision of appropriate internal guidance to staff to ensure consistency in the use of the *rating system*, including the assignment of *exposures* or facilities to pools or grades;

(d) dealing with potential weaknesses of the *rating system*;

(e) identifying appropriate and inappropriate uses of the *rating system* and acting on that identification;

(f) novel or narrow rating approaches; and

(g) ensuring the appropriate level of stability over time of the *rating system*.

Rating systems: Overrides

4.3.50 R For grade and pool assignments a *firm* must document the situations in which human judgement may override the inputs or outputs of the assignment process and the personnel responsible for approving these overrides. A *firm* must document these overrides and the personnel responsible. A *firm* must analyse the performance of the *exposures* whose assignments have been overridden. This analysis must include assessment of the performance of *exposures* whose rating has been overridden by a particular *person*, accounting for all the responsible personnel.

[**Note:** *BCD* Annex VII Part 4 point 25]

Rating systems: Use of models

4.3.51 R

(1) This paragraph applies to the use of statistical models and/or other mechanical methods to assign *exposures* to *obligor grades*, obligor pools, *facility grades* or facility pools.

(2) A *firm* must be able to demonstrate to the *appropriate regulator* that the model has good predictive power and that capital requirements are not distorted as a result of its use.

(3) The input variables to the model must form a reasonable and effective basis for the resulting predictions. The model must not have material biases.

(4) A *firm* must have in place a process for vetting data inputs into the model, which includes an assessment of the accuracy, completeness and appropriateness of the data.

(5) A *firm* must be able to demonstrate to the *appropriate regulator* that the data used to build the model is representative of the population of the *firm's* actual obligors or *exposures*.

(6) A *firm* must have a regular cycle of model validation that includes monitoring of model performance and stability, review of model specification and testing of model outputs against outcomes.

(7) A *firm* must complement the statistical model by human judgement and human oversight to review model-based assignments and to ensure that the models are used appropriately. Review procedures must aim at finding and limiting errors associated with model weaknesses. Human judgements must take into account all relevant information not considered by the model. A *firm* must document how human judgement and model results are to be combined.

(8) Use of a model obtained from a third-party vendor that claims proprietary technology is not a justification for exemption from documentation or any other of the requirements in ■ BIPRU 4 or a *firm's IRB permission* for *rating systems*. A *firm* must be able to satisfy the *appropriate regulator* that all those requirements are satisfied if it uses such a model.

[**Note:** *BCD* Annex VII Part 4 points 30 and 35 (part)]

4.3.52 G (1) This paragraph contains guidance on ■ BIPRU 4.3.51 R (7).

(2) ■ BIPRU 4.3.51 R (7) does not require that each individual assignment of an *exposure* to a pool or grade should be the subject of an open-ended review by reference to factors not covered by the model if:

(a) that is not necessary in order to meet the requirements of ■ BIPRU 4 about the ability of the *rating system* to predict and to discriminate (as referred to in ■ BIPRU 4.3.29 R to ■ BIPRU 4.3.30 R (Validation of internal estimates)); and

(b) the outputs of the model are not designed to be supplemented by such a review.

4.3.53 G (1) This paragraph contains *guidance* on ■ BIPRU 4.3.51 R for the use of external models.

(2) ■ BIPRU 4.3.51 R (2) - ■ BIPRU 4.3.51 R (8) also apply to mechanical methods to assign *exposures* or obligors to facility grades or pools and to a combination of models and mechanical methods.

(3) The standards which a *firm* applies to an external model should not be lower than those for internal models.

(4) The *appropriate regulator* will not accredit any individual model or vendor. The burden is on a *firm* to satisfy itself that external models are fit for purpose and meet the relevant requirements of the *IRB approach*.

(5) Notwithstanding that commercial confidentiality may limit the willingness of vendors of external models to disclose all details, a *firm* should ensure that it is able to obtain sufficiently detailed information to be able to satisfy the requirements of the *IRB approach*.

(6) A *firm* should have a clear understanding of responsibilities for support and maintenance of external models. This should include how new developments will be brought in and what entitlement the *firm* has to receive and/or request specific enhancements. A *firm* should ensure that the requirements of BIPRU 4.3.51 R and other provisions of the *IRB approach* are complied with on an ongoing basis.

(7) If a *firm* uses an external model it should have regard to the following:

(a) the adequacy of the information it has about the population on which the model is built;

(b) the comparability of the population referred to in (a) to the *exposures* with respect to which it is using that model;

(c) what the drivers of the model are and their relevance to the *exposures* with respect to which it is using the model; and

(d) how the *firm* satisfies itself that the standards required by the *IRB approach* for an internal model are met by the external model.

Rating systems: Data maintenance

4.3.54 R A *firm* must collect and store data on aspects of its internal ratings as required under BIPRU 11 (Disclosure).

[**Note:** *BCD* Annex VII Part 4 point 36]

Rating systems: IT systems

4.3.55 G A *firm* should ensure that IT systems relevant to the operation of its *rating systems* are sound and robust. A *firm's* IT systems should provide rapid availability of databases and appropriate archiving. Adequate controls should be in place to prevent unauthorised changes to data being made. Contingency processes and plans should be in place to deal with events of system failure. A *firm* should document work-flows and procedures related to data collection and storage.

Definition of default: Main provisions

4.3.56 R A *default* must be considered to have occurred with regard to a particular obligor when either or both of the two following events has taken place:

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(1) the *firm* considers that the obligor is unlikely to pay its credit obligations to the *firm*, the *parent undertaking* or any of its *subsidiary undertakings* in full, without recourse by the *firm* to actions such as realising security (if held); and

(2) the obligor is past due more than 90 days on any material credit obligation to the *firm*, the *parent undertaking* or any of its *subsidiary undertakings*.

[**Note:** *BCD* Annex VII Part 4 point 44 (part)]

4.3.57 R The following provisions also apply with respect to the definition of *default*:

(1) for overdrafts, days past due commence once an obligor has breached an advised limit, has been advised a limit smaller than current outstandings, or has drawn credit without authorisation and the underlying amount is material;

(2) an advised limit means a limit which has been brought to the knowledge of the obligor;

(3) days past due for credit cards commence on the minimum payment due date;

(4) in the case of *retail exposures* and *exposures* to *public sector entities* the number of days past due is as set out in BIPRU 4.4.22 R and BIPRU 4.6.20 R; and

(5) in all cases for the purposes of the definition of *default*, a credit obligation or, for overdrafts, the underlying amount, is material if, when added to the other *exposures* of the obligor, the total exceeds the amount which the *firm* treats as a material default for its internal risk measurement and management purposes.

[**Note:** *BCD* Annex VII Part 4 point 44 (part)]

Definition of default: Materiality

4.3.58 R Where a *firm* applies the definition of *default* at facility level in accordance with BIPRU 4.6.21 R, it should define materiality for the purposes of BIPRU 4.3.57 R (5) by reference to the facility amount only, disregarding other *exposures* of the obligor.

4.3.59 R A *firm* must have a policy which sets out how it will determine whether a credit obligation or, for overdrafts, the underlying amount, is material for the purposes of the definition of *default* in BIPRU 4.3.56 R (2) and BIPRU 4.3.57 R (5).

Definition of default: Identification of obligor

4.3.60 G (1) This paragraph contains *guidance* on the definition of *default*.

(2) If:

(a) a *firm* ordinarily assigns *exposures* in the *sovereign, institution and corporate IRB exposure class* to a member of a group substantially on the basis of membership of that group and a common group rating; and

(b) the *firm* does so in the case of a particular group;

(3) the *firm* should consider whether members of that group should be treated as a single obligor for the purpose of the definition of *default*.

(4) The *appropriate regulator* would not expect a *firm* to treat an obligor as part of a single obligor under (2) if the *firm* rates its *exposures* on a stand alone basis or if its rating is notched. A rating is notched if it takes into account individual risk factors or otherwise reflects risk factors that are not applied on a common group basis.

(5) Accordingly if a group has two members who are separately rated the *default* of one does not necessarily imply the *default* of the other.

Definition of default: Days past due

4.3.61 G (1) This paragraph contains *guidance* on the meaning of days past due for the purposes of the definition of *default*.

(2) If an amount is overdue by the relevant number of days past due because of administrative oversight on the part of the obligor or the *firm*, a *firm* with sufficient information may, retrospectively if necessary, treat that as not involving a *default* if:

(a) that failure is not associated with any increase in the risk referred to in BIPRU 4.3.56 R (1); and

(b) treating it as not being in *default* is consistent with the way that the *firm* treated the failure in its relationship with the obligor.

(3) If a *firm* takes advantage of this provision it should have a policy about the circumstances in which it can apply the treatment in (2). That policy should be documented and consistently applied.

4.3.62 G Days past due is only one part of the definition of *default* and should be treated as a back-stop. A *firm* should not rely solely on the number of days past due set by BIPRU 4 but should also consider all other indicators of unlikeliness to pay when assessing whether a *default* has occurred.

Definition of default: Unlikeliness to pay

4.3.63 R (1) Elements to be taken as indications of unlikeliness to pay must include the items set out in this *rule*.

(2) The *firm* putting the credit obligation on non-accrued status must be taken as an indication of unlikeliness to pay.

(3) The *firm* making a value adjustment resulting from a significant perceived decline in credit quality subsequent to the *firm* taking on the *exposure* must be taken as an indication of unlikeliness to pay.

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(4) The *firm* selling the credit obligation at a material credit-related economic loss must be taken as an indication of unlikeliness to pay.

(5) The *firm* consenting to a distressed restructuring of the credit obligation must be taken as an indication of unlikeliness to pay where this is likely to result in a diminished financial obligation caused by the material forgiveness, or postponement, of principal, interest or (where relevant) fees. This includes in the case of *equity exposures* assessed under a *PD/LGD approach*, distressed restructuring of the equity itself.

(6) The *firm* having filed for the obligor's bankruptcy or a similar order in respect of an obligor's credit obligation to the *firm*, the *parent undertaking* or any of its *subsidiary undertakings* must be taken as an indication of unlikeliness to pay.

(7) The obligor seeking or having been placed in bankruptcy or similar protection where this would avoid or delay repayment of a credit obligation to the *firm*, the *parent undertaking* or any of its *subsidiary undertakings* must be taken as an indication of unlikeliness to pay.

[**Note:** *BCD* Annex VII Part 4 point 45]

4.3.64 G A *firm* may use the amount overdue as an additional indication of unlikeliness to pay. If a *firm* uses this approach, the days past due element of the definition of *default* continues to apply, including the provisions relating to the fixed number of days past due referred to in ■ BIPRU 4.3.57 R (4). A *firm* might make the use of a definition of *default* that takes into account the amount overdue consistent with the days past due element of the definition by setting the amount overdue at such a level that, taking into account:

(1) the order in which payments are applied against overdue payments; and

(2) the number of payment dates, the time between them, the amount of the overdue payments that results in a *default* under the definition used by the *firm* and other relevant factors;

it is not possible for any payment to be past due by a number of days exceeding the maximum amount specified in *BIPRU* for the purposes of the definition of *default* without there being a *default* under the part of the definition of *default* based on the amount overdue.

4.3.65 G In the case of a *retail exposure*, a value adjustment resulting from significant perceived decline in credit quality falling within ■ BIPRU 4.3.63 R (3) need not necessarily be taken as an indication of unlikeliness to pay if a *firm* employs formulaic portfolio provisioning based on a number of days overdue for its *retail exposures*. However, if such an *exposure* reaches the compulsory days past due indicator for the purposes of the definition of *default* it should automatically be deemed to be in *default*, regardless of the provisioning situation.

4.3.66 G An obligation should be considered a distressed restructuring under ■ BIPRU 4.3.63 R (5) if an independent third party, with expertise in the relevant area, would not be prepared to provide financing on substantially the same terms and conditions.

4.3.67 G

(1) The realisation or forfeiture of collateral may be taken as an indication of unlikeliness to pay for the purposes of the definition of *default*.

(2) However, the realisation or forfeiture of collateral may not indicate unlikeliness to pay:

(a) in the case of an *exposure* in a market (such as one that involves *retail exposures* involving margin lending) in which it is established practice for collateral to be sold if its value falls below a certain percentage of the *exposure* and the obligor does not restore the margin (but this exception does not apply if the value of the collateral has fallen below the amount outstanding); or

(b) if the *firm* is able to demonstrate that for some other reason the realisation or forfeiture of collateral is not a meaningful indication of unlikeliness to pay.

4.3.68 G

(1) If an obligor approach is being taken with respect to *retail exposures* (that is, the application of the definition of *default* at an obligor level rather than at a facility level as set out in BIPRU 4.6.21 R,) a *firm* should ensure that the *PD* associated with unsecured *exposures* is not understated as a result of the presence of any collateralised *exposures*. A *firm* should be able to explain to the *appropriate regulator*, if asked, how it has ensured that its estimate of *PD* is appropriate for both secured and unsecured *exposures* covered by an obligor rating approach.

(2) In the view of the *appropriate regulator*, *firms* typically find that the *PD* of a residential mortgage is lower than the *PD* of an unsecured loan to the same borrower.

4.3.69 G

A *firm* may, but without prejudice to BIPRU 4.4.22 R and BIPRU 4.6.20 R (Fixed numbers of days past due), use additional, or stricter, indicators of unlikeliness to pay if it uses these indicators for internal purposes in accordance with BIPRU 4.2.2 R (2) (Use tests) and if the disclosures under BIPRU 11 (Disclosure) are on this basis.

Risk quantification: Definition of default: Other provisions

4.3.70 R

A *firm* must (if it uses external data that is not itself consistent with the definition of *default*) be able to demonstrate to the *appropriate regulator* that appropriate adjustments have been made that achieve broad equivalence with the definition of *default*.

[**Note:** *BCD* Annex VII Part 4 point 46]

4.3.71 R

If a *firm* considers that a previously *defaulted exposure* is such that no trigger of *default* continues to apply, the *firm* must rate the obligor or facility as it would for a non-*defaulted exposure*. Should the definition of *default* subsequently be triggered, another *default* must be deemed to have occurred.

[**Note:** *BCD* Annex VII Part 4 point 47]

4.3.72 G A *firm* should have a clear and documented policy for determining whether an *exposure* that has been in *default* should subsequently be returned to performing status.

Risk quantification: Overall requirements for estimation: General

4.3.73 R BIPRU 4.3.74 R to BIPRU 4.3.131 R apply to a *firm*'s own estimates of risk parameters used in the *IRB approach*.

[**Note:** *BCD* Annex VII Part 4 point 43]

4.3.74 R A *firm*'s own estimates of the risk parameters *PD*, *LGD*, *conversion factor* and *EL* must incorporate all relevant data, information and methods. The estimates must be derived using both historical experience and empirical evidence, and must not be based purely on judgemental considerations. The estimates must be plausible and intuitive and must be based on the material drivers of the respective risk parameters. The less data a *firm* has, the more conservative it must be in its estimation.

[**Note:** *BCD* Annex VII Part 4 point 49]

4.3.75 G

(1) This paragraph provides guidance on BIPRU 4.3.73 R.

(2) Relevant data and information under BIPRU 4.3.73 R includes external data.

(3) Where internal *default* and *loss* experience is scarce, a *firm* should consider using material relevant external information. When using external information such as industry averages when determining *LGD* or *conversion factors*, a *firm* should consider whether this data is appropriate to its own experience and whether adjustments are necessary.

4.3.76 R

(1) In calculating estimates of *PD*, *LGD* and *conversion factors* a *firm* must adjust the averages of historical experience referred to in the historical averages rules in order to ensure that those estimates are accurate estimates of the *default* rate, *loss* rate or *conversion factor* over the long-run.

(2) The historical average rules means the requirements in BIPRU 4 relating to the calculation of *PD*, *LGD* and *conversion factors* using historical averages (and in particular BIPRU 4.4.24 R, BIPRU 4.4.30 R, BIPRU 4.8.7 R, BIPRU 4.8.8 R, BIPRU 4.6.24 R, BIPRU 4.6.27 R, BIPRU 4.3.99 R and BIPRU 4.3.125 R).

4.3.77 G Where a *firm* is able to demonstrate that the effect is immaterial in accordance with BIPRU 4.1.25 R (Compliance), it may estimate average *LGDs* and *conversion factors* under the historical average rules in a way that does not strictly comply with BIPRU 4.3.94 R (Default weighted average), provided the final estimates of *LGD* and *conversion factors* following the adjustments to averages of historical experience are made on the basis of *default* weighted averages for the *facility grade* or pool in question.

4.3.78 G A *firm* may carry out the adjustments under BIPRU 4.3.76 R (Adjustments to averages of historical experience) by adjusting the data from which estimates are made rather than by adjusting the estimates themselves if it can demonstrate that capital requirements are not underestimated as a result.

4.3.79 G While the qualitative requirements in BIPRU 4 are important for all portfolios, they are of even greater importance in those cases where a *firm* lacks sufficient historical data to calibrate or validate its estimates of *PD*, *LGD* or *conversion factors* on the basis of proven statistical significance, sometimes referred to as low default portfolios.

4.3.80 R

(1) A *firm* must collect data on what it considers to be the main drivers of the risk parameters *PD*, *LGD*, *conversion factor* and *EL* for each group of obligors or facilities.

(2) A *firm* must document its identification of the main drivers of risk parameters.

(3) A *firm* must be able to demonstrate that its process of identification is reasonable and appropriate.

4.3.81 R In its processes for identifying the main drivers of risk parameters, a *firm* must set out its reasons for concluding that the data sources chosen provide in themselves sufficient discriminative power and accuracy and why additional potential data sources do not provide relevant and reliable information that would be expected materially to improve the discriminative power and accuracy of its estimates of the risk parameter in question. This does not require an intensive analysis of all factors.

4.3.82 G If a *firm* uses a rating model to assign exposures to the borrower or facility grades, it may reflect the data on main drivers of risk parameters by its inclusion in the model as a risk driver or as part of a subsequent process that adjusts the output of that model to calculate the risk parameters *PD*, *LGD*, *conversion factor* and *EL*.

4.3.83 R A *firm* must be able to provide a breakdown of its loss experience in terms of *default* frequency, *LGD*, *conversion factor*, or *loss* where *EL* estimates are used, by the factors it sees as the drivers of the respective risk parameters. A *firm* must be able to demonstrate to the *appropriate regulator* that its estimates are representative of long-run experience.

[**Note:** *BCD* Annex VII Part 4 point 50]

4.3.84 R Any changes in lending practice or the process for pursuing recoveries over the observation periods referred to in BIPRU 4.4.31 R (Observation period for sovereigns, institutions and corporates for PDs), BIPRU 4.6.28 R (Observation period for retail exposures for PDs), BIPRU 4.4.54 R (Observation period for sovereigns, institutions and corporates for LGDs), BIPRU 4.6.33 R (Observation period for retail exposures for LGDs), BIPRU 4.4.55 R (Observation period for sovereigns, institutions and corporates for conversion factors) and BIPRU 4.6.38 R (Observation period for retail exposures for conversion factors) must be taken into account. A *firm's* estimates must reflect the implications of technical advances and new data and other information, as it becomes available. A *firm* must review its estimates when new information comes to light but at least on an annual basis.

[**Note:** *BCD* Annex VII Part 4 point 51]

4.3.85 R The population of *exposures* represented in the data used for estimation, the lending standards used when the data was generated and other relevant characteristics must be comparable with those of a *firm's exposures* and standards. A *firm* must also be able to demonstrate to the *appropriate regulator* that the economic or market conditions that underlie the data are relevant to current and foreseeable conditions. The number of *exposures* in the sample and the data period used for quantification must be sufficient to provide a *firm* with confidence in the accuracy and robustness of its estimates.

[**Note:** *BCD* Annex VII Part 4 point 52]

4.3.86 G It may be reasonable for a *firm* to treat foreseeable in BIPRU 4.3.85 R as referring to the most distant date to which it carries out detailed capital planning.

4.3.87 G A *firm* should be able to demonstrate to the *appropriate regulator*:

(1) how, with respect to each *rating system*, both assignment of ratings and estimates of *PD*, *LGD* and *conversion factors* are affected by:

(a) movements in the economic cycle; and

(b) other cyclical effects which are material to levels of *default*, *loss* or the amount of *exposures* at *default* for the *exposures* covered by the *rating system*; and

(2) the level of conservatism inherent in its ratings, as provided for by *BIPRU*.

4.3.88 R A *firm* must add to its estimates a margin of conservatism that is related to the expected range of estimation errors. Where methods and data are less satisfactory and the expected range of errors is larger, the margin of conservatism must be larger.

[**Note:** *BCD* Annex VII Part 4 point 54]

4.3.89 G Estimation of *PD* through the use of a technique set out in *BIPRU* does not remove the need to make conservative adjustments, where necessary, related to the expected range of estimation errors so that capital requirements produced by the relevant model or other *rating system* are not understated.

4.3.90 R If a *firm* uses different estimates for the calculation of *risk weights* and internal purposes it must be documented. The *firm* must be able to demonstrate to the *appropriate regulator* the reasonableness of such estimates.

[**Note:** *BCD* Annex VII Part 4 point 55]

4.3.91 G If a *firm* can demonstrate to the *appropriate regulator* that for data that has been collected prior to 31 December 2006, appropriate adjustments have been made to achieve broad equivalence with the definitions of *default* or *loss*, the *appropriate regulator* may in the *IRB permission* allow the *firm* some flexibility in the application of the required standards for data.

[**Note:** *BCD* Annex VII Part 4 point 56]

Risk quantification: Overall requirements for estimation: Pooled data

4.3.92 R If a *firm* uses data that is pooled across *institutions* it must be able to demonstrate to the *appropriate regulator* that:

(1) the *rating systems* and criteria of other firms in the pool are similar to its own;

(2) the pool is representative of the portfolio for which the pooled data is used; and

(3) the pooled data is used consistently over time by the *firm* for its permanent estimates.

[**Note:** *BCD* Annex VII Part 4 point 57]

4.3.93 G BIPRU 4.3.92 R (1) is intended to ensure that data entering a pool is consistent and does not contain distortions as a result of different contributors' practices. It is not intended to constrain the use of pooled data by one *firm* that is contributed by a second *firm* where the differences do not affect the data being contributed.

4.3.94 R If a *firm* uses data that is pooled across *institutions* it remains responsible for the integrity of its *rating systems*. If a *firm* uses such data it must be able to demonstrate to the *appropriate regulator* that it has sufficient in-house understanding of its *rating systems*, including effective ability to monitor and audit the rating process.

[**Note:** *BCD* Annex VII Part 4 point 58]

Risk quantification: Overall requirements for estimation: Requirements specific to PD estimates

4.3.95 R (1) If:

(a) a *firm's* internal experience of *exposures* of a type covered by a model or other *rating system* is 20 *defaults* or fewer; and

(b) in the *firm's* view, reliable estimates of *PD* cannot be derived from external sources of *default* data, including the use of

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market price related data, for all the *exposures* covered by the *rating system*;

the *firm* must estimate *PD* for *exposures* covered by that *rating system* in accordance with this *rule*.

(2) A *firm* must use a statistical technique to derive the distribution of *defaults* implied by the *firm's* experience, estimating *PDs* (the "statistical PD") from the upper bound of a confidence interval set by the *firm* in order to produce conservative estimates of *PDs* in accordance with BIPRU 4.3.88 R.

(3) The techniques chosen for the purposes of (2) must take account, as a minimum, of the following modelling issues:

(a) the number of *defaults* and number of obligor years in the sample;

(b) the number of years from which the sample was drawn;

(c) the interdependence between *default* events for individual obligors;

(d) the interdependence between *default* rates for different years; and

(e) the choice of the statistical estimators and the associated distributions and confidence intervals.

(4) The *firm* must further adjust the statistical PD to the extent necessary to take account of the following:

(a) any likely differences between the observed *default* rates over the period covered by the *firm's default* experience and the long-run *PD* for each grade in accordance with BIPRU 4.4.24 R and BIPRU 4.6.24 R; and

(b) any other information that indicates (taking into account the robustness and cogency of that information) that the statistical PD is likely to be an inaccurate estimate of *PD*.

(5) This *rule* is in addition to the other requirements in *BIPRU* about the calculation of *PD*.

(6) When a *firm* calculates whether it has 20 *defaults* or fewer under the calculation in (1)(a), it must only take into account *defaults* that occurred during periods that are relevant to the validation under BIPRU 4 of the model or other *rating system* in question.

4.3.96 G A *firm* may if appropriate also choose to use the approach in BIPRU 4.3.91 G if the internal experience on *exposures* covered by a *rating system* is greater than 20 *defaults*.

4.3.97 G If a *firm* excludes *defaulted exposures* that have been cured (as referred to in BIPRU 4.3.71 R) or restructured (as referred to in BIPRU 4.3.63 R (5)) from estimates of *LGD* in accordance with BIPRU 4.3.110 G, it may also exclude cures from estimates of *PD* for these *exposures*.

Risk quantification: Overall requirements for estimation: Requirements specific to own-LGD estimates

4.3.98 R ■ BIPRU 4.3.98 R to ■ BIPRU 4.3.123 R set out requirements specific to own-*LGD* estimates.

4.3.99 R A *firm* must estimate *LGDs* by *facility grade* or pool on the basis of the average realised *LGDs* by *facility grade* or pool using all observed *defaults* within the data sources (*default* weighted average).

[**Note:** *BCD* Annex VII Part 4 point 73]

4.3.100 R A *firm* must calculate the *default* weighted average on the basis of the number of *defaults* included in the calculations made under the historical average rules so far as they relate to the calculation of *PDs* and must not be weighted by the size of *exposures*.

4.3.101 R

(1) A *firm*'s estimates of *LGDs* must take into account:

(a) data in respect of relevant incomplete workouts; and

(b) the possibility that the proportion of *defaulted exposures* which are cured (as referred to in ■ BIPRU 4.3.71 R) or restructured (as referred to in ■ BIPRU 4.3.63 R (5)) or the length of the period over which a *firm* makes recoveries under a *defaulted exposure* may be different from the *firm's* observed historic experience.

(2) An incomplete workout as referred to in (1)(a) means a *defaulted exposure* included in the data set on which the *firm's LGD* estimates are based, but for which the recovery process is still in progress, with the result that the final realised *losses* in respect of that *exposure* are not yet certain.

4.3.102 G The changes referred to in ■ BIPRU 4.3.101 R (1)(b) may be caused by external factors, such as the economic environment, as well as factors specific to the obligor, the transaction or the policies of the *firm*.

4.3.103 R A *firm* must use *LGD* estimates that are appropriate for an economic downturn if those are more conservative than the long-run average. To the extent a *rating system* is expected to deliver constant realised *LGDs* by grade or pool over time, a *firm* must make adjustments to its estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn.

[**Note:** *BCD* Annex VII Part 4 point 74]

4.3.104 R

(1) A *firm* must have a rigorous and well documented process for:

(a) assessing the effects, if any, of economic downturn conditions on recovery rates; and

(b) producing *LGD* estimates consistent with downturn conditions as referred to in ■ BIPRU 4.3.103 R.

(2) That process must include the following, which may be included in an integrated manner:

(a) identification of appropriate downturn conditions for each *IRB exposure class* within each jurisdiction;

(b) identification of adverse dependencies, if any, between *default* rates and recovery rates; and

(c) incorporation of adverse dependencies, if identified, between *default* rates and recovery rates in the *firm's* estimates of *LGD* in a manner that meets the requirements in BIPRU 4.3.103 R relating to an economic downturn.

4.3.105 G A *firm* may derive the *LGD* in accordance with BIPRU 4.3.104 R (2)(c) either by directly assigning to the *facility grade* or pool an estimate of *LGD* appropriate for downturn conditions, or alternatively by estimating a *default* weighted average *LGD* in accordance with BIPRU 4.3.99 R and BIPRU 4.3.76 R and converting it into an *LGD* appropriate for downturn conditions by the use of a formula. It should be able to demonstrate that that formula produces well-founded estimates of *LGDs* consistent with downturn conditions for the *exposures* in question.

4.3.106 G A *firm* may combine *IRB exposure classes*, jurisdictions or both for the purpose of BIPRU 4.3.104 R (2)(a) if it can demonstrate that the downturn conditions to which the portfolios are subject will be similar.

4.3.107 G The adverse dependencies referred to in BIPRU 4.3.104 R (2)(b) will not always exist. However, if a *firm* uses *LGDs* that do not allow for such adverse dependencies, it should be able to justify its decision.

4.3.108 G Data relating to economic downturn conditions is likely to be scarce. Accordingly, a *firm* should use internal data, external data or a combination of data sources in order to produce appropriate downturn *LGD* estimates in accordance with BIPRU 4.3.103 R.

4.3.109 R A *firm* must retain sufficient data on both *LGDs* calculated on a economic downturn basis and calculated on a long-run average basis (as referred to in BIPRU 4.3.103 R) to be able to demonstrate to the *appropriate regulator* (if asked) that its estimates based on an economic downturn are no less conservative than the long-run average as referred to in that *rule*.

4.3.110 G Where a *firm* is able to demonstrate that the effect is immaterial in accordance with BIPRU 4.1.25 R (Compliance), it may exclude *defaulted exposures* that have been cured (as referred to in BIPRU 4.3.67 G (1)) or restructured (as referred to in BIPRU 4.3.63 R (5)) from the data about *default* and *loss* experience on which *LGDs* are calculated provided it can demonstrate that its calculation of capital requirements (including capital requirements resulting from the application of capital floors under the transitional *rules* and *guidance* in *BIPRU*) are not reduced as a result of this approximation.

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4.3.111 R Irrespective of whether calculated on an economic downturn or long-run average basis, each *LGD* estimate must be at least zero.

4.3.112 G In order to support an *LGD* estimate which is very low or zero, a *firm* should be able to demonstrate that the estimate adequately reflects the expected experience on a *default* weighted average basis or in a downturn as appropriate, taking into account the costs and discount rate associated with realisations and the operation of BIPRU 4.3.118 R.

4.3.113 R The methods that a *firm* uses for discounting cash flows for the purposes of estimating *LGDs* must take account of the uncertainties associated with the receipt of recoveries with respect to a *defaulted exposure*. If a *firm* intends to use a discount rate that does not take full account of the uncertainty in recoveries, it must be able to explain by what other process it has taken into account that uncertainty for the purposes of calculating *LGDs*.

4.3.114 G The uncertainty referred to in BIPRU 4.3.113 R can be addressed by adjusting cash flows to certainty-equivalents or by using a discount rate that embodies an appropriate risk premium; or by a combination of the two.

4.3.115 G A *firm* may exclude from its calculation of *loss* indirect costs that it incurs for the purpose of making recoveries with respect to a *defaulted exposure* if it would also have incurred those costs if there had not been a *default*.

4.3.116 R A *firm* must consider the extent of any dependence between the risk of the obligor with that of the collateral or collateral provider. Cases where there is a significant degree of dependence must be addressed in a conservative manner.

[**Note:** *BCD* Annex VII Part 4 point 75]

4.3.117 R Currency mismatches between the underlying obligation and the collateral must be treated conservatively in the *firm's* assessment of *LGD*.

[**Note:** *BCD* Annex VII Part 4 point 76]

4.3.118 R To the extent that *LGD* estimates take into account the existence of collateral, these estimates must not solely be based on the collateral's estimated market value. *LGD* estimates must take into account the effect of the potential inability of the *firm* expeditiously to gain control of its collateral and liquidate it.

[**Note:** *BCD* Annex VII Part 4 point 77]

4.3.119 G

(1) A *firm* may comply with BIPRU 4.3.118 R by reducing the amount of the collateral taken into account for the purposes of calculating *LGD* (applying a haircut to the collateral), basing that reduction on validated realisation experience and using conservatism to reflect the uncertainties.

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(2) If collateral is used to reduce the *LGD*, a *firm* should be able to demonstrate how the risk in BIPRU 4.3.118 R has been accounted for. To the extent that it is adequately accounted for in that way it need not be reflected again as part of the residual risk in relation to collateral under the *overall Pillar 2 rule*.

4.3.120 R To the extent that *LGD* estimates take into account the existence of collateral, a *firm* must establish internal requirements for collateral management, legal certainty and risk management that are generally consistent with those set out in BIPRU 5 (Credit risk mitigation) as modified by BIPRU 4.10.

[**Note:** *BCD* Annex VII Part 4 point 78]

4.3.121 R To the extent that a *firm* recognises collateral for determining the exposure value for *counterparty credit risk* according to the *CCR standardised method* or the *CCR internal model method*, any amount expected to be recovered from the collateral must not be taken into account in the *LGD* estimates.

[**Note:** *BCD* Annex VII Part 4 point 79]

4.3.122 R For the specific case of *exposures* already in *default*, a *firm* must use the sum of its best estimate of *expected loss* for each *exposure* given current economic circumstances and *exposure* status and the possibility of additional unexpected *losses* during the recovery period.

[**Note:** *BCD* Annex VII Part 4 point 80]

4.3.123 R To the extent that unpaid late fees have been capitalised in a *firm*'s income statement, they must be added to the *firm*'s measure of *exposure* and *loss*.

[**Note:** *BCD* Annex VII Part 4 point 81]

Risk quantification: Overall requirements for estimation: Requirements specific to own-conversion factor estimates

4.3.124 R BIPRU 4.3.125 R - BIPRU 4.3.131 R set out requirements specific to own-*conversion factor* estimates.

4.3.125 R A *firm* must estimate *conversion factors* by *facility grade* or pool on the basis of the average expected *conversion factors* by *facility grade* or pool using all observed *defaults* within the data sources (*default* weighted average).

[**Note:** *BCD* Annex VII Part 4 point 87]

4.3.126 G

(1) A *firm* using own estimates of *conversion factors* should take into account all facility types that may result in an *exposure* when an obligor *defaults*, including uncommitted facilities.

(2) A *firm* should treat a facility as an *exposure* from the earliest date at which a customer is able to make drawings under it.

(3) To the extent that a *firm* makes available multiple facilities, it should be able to demonstrate:

(a) how it deals with the fact that *exposures* on one may become *exposures* under another on which the *losses* are ultimately incurred; and

(b) the impact of its approach on its capital requirements.

4.3.127 R A *firm* must use *conversion factor* estimates that are appropriate for an economic downturn if those are more conservative than the long-run average. To the extent a *rating system* is expected to deliver realised *conversion factors* at a constant level by grade or pool over time, a *firm* must make adjustments to its estimates of risk parameters by grade or pool to limit the capital impact of an economic downturn.

[**Note:** *BCD* Annex VII Part 4 point 88]

4.3.128 R A *firm*'s estimates of *conversion factors* must reflect the possibility of additional drawings by the obligor up to and after the time a *default* event is triggered. The *conversion factor* estimate must incorporate a larger margin of conservatism where a stronger positive correlation can reasonably be expected between the *default* frequency and the magnitude of *conversion factor*.

[**Note:** *BCD* Annex VII Part 4 point 89]

4.3.129 R In arriving at estimates of *conversion factors* a *firm* must consider its specific policies and strategies adopted in respect of account monitoring and payment processing. A *firm* must also consider its ability and willingness to prevent further drawings in circumstances short of payment *default*, such as covenant violations or other technical *default* events.

[**Note:** *BCD* Annex VII Part 4 point 90]

4.3.130 R A *firm* must have adequate systems and procedures in place to monitor facility amounts, current outstandings against committed lines and changes in outstandings per obligor and per grade. A *firm* must be able to monitor outstanding balances on a daily basis.

[**Note:** *BCD* Annex VII Part 4 point 91]

4.3.131 R If a *firm* uses different estimates of *conversion factors* for the calculation of *risk weighted exposure amounts* and internal purposes it must be documented. The *firm* must be able to demonstrate their reasonableness to the *appropriate regulator*.

[**Note:** *BCD* Annex VII Part 4 point 92]

Risk quantification: Overall requirements for estimation: Comparability

4.3.132 G (1) This paragraph contains *guidance* about the interpretation of the requirements relating to comparability in BIPRU 4.3.85 R. It is also relevant to the requirement for representative data in BIPRU 4.3.51 R (5), to the references to comparability in the additional *guidance* in BIPRU 4.3.53 G (7)(b) and to the requirements for similarity in BIPRU 4.3.92 R.

(2) In general, comparability should be based on analyses of the population of *exposures* represented in the data, the lending standards used when the data was generated (where relevant) and other relevant characteristics in relation to the corresponding properties of the *firm's* own portfolio. Other relevant characteristics could include the distribution of the obligors across industries, the size distribution of the *exposures* and similarity with respect to the geographic or demographic distribution of the *exposures*.