Annex 5

Supervisory Requirements on IRB Approach

1. General Requirements

1.1 To measure the regulatory capital for credit risk through the Internal Rating-Based approach (hereinafter referred to as the “IRB approach”), a commercial bank shall establish an internal rating system according to the requirements of the Rules.

Internal rating system shall cover the policies and practices for the internal rating of sovereign exposures, financial institution exposures and corporate exposures (hereinafter referred to as “the non-retail exposures”) as well as the policies and practices for asset pool assignment of retail exposures.

1.2 Internal rating system of a commercial bank shall be effective in credit risk identification, categorization, listing by materiality, and quantification. The system shall consist of the following basic elements:

1.2.1 Corporate governance and oversight, to ensure the objectivity and reliability of the internal ratings results;

1.2.2 Technical standards for the internal rating of non-retail exposures and for asset pool assignment of retail exposures, to ensure that each borrower or facility of the non-retail exposures falls into the corresponding risk grade and each retail exposure falls into the corresponding asset pool;
1.2.3 Internal rating procedures, to ensure the independence and impartiality of the internal ratings;

1.2.4 Risk quantification, to ensure that the risk characteristics of the borrower and facility are translated into such risk parameters as probability of default (PD), loss given default (LGD), exposure at default (EAD) and maturity (M); and

1.2.5 IT and data management system, to ensure effective collection and processing of relevant information for internal rating purpose, as well as effective support to risk assessment and quantification of risk parameters.

2. Corporate Governance and Oversight

According to Chapter 7 of the Rules, a commercial bank shall have a sound corporate governance and oversight for the internal rating purpose, which shall in general meet the following requirements:

2.1 The bank shall have the clearly defined responsibilities for the board of directors, the related board committees, the supervisory board, senior management, and the related departments, as well as the reporting requirements for the internal rating system.

2.2 The board of directors shall have the primary responsibility for the management of the internal rating system and shall perform the following duties:

2.2.1 To review and approve the major policies in relations to the internal rating system, and ensure the bank’s compliance with the regulatory requirements in such areas as the design and procedures of the internal rating systems, the quantification of risk parameters, management and validation of the IT system and data, and the application of the internal ratings results;
2.2.2 To approve the implementation plans of the internal rating system, fully understand the policies and procedures for the internal rating system, and ensure that the bank has sufficient resources for the development and improvement of the internal rating system;

2.2.3 To oversee the conduct of the senior management to ensure that the management make proper decisions and effectively implement the internal ratings policies and procedures;

2.2.4 To conduct at least one inspection of the effectiveness of the internal rating system each year; and

2.2.5 To review and approve, or authorize others to review and approve other significant matters relating to internal rating system.

2.3 The senior management of a commercial bank shall be responsible for the development and operation of the internal rating system, clarifying the relevant requirements for parameters quantification techniques, performance evaluation and monitoring measures in relation to the internal ratings, making decisions on the design, operation, improvement, reporting and rating policies, with a view to ensuring the sustainable and effective operations of the system. The senior management shall perform the following specific duties:

2.3.1 To allocate resources for the development, application, operation and maintenance of the internal rating system in accordance with implementation plans approved by the board of directors;

2.3.2 To develop the supporting policies and procedures for the internal rating system, clarify the duties of the related departments or personnel, and set forth and implement effective accountability system. When necessary, the senior management shall revise the existing credit risk management policies and procedures and controls
to ensure the integration of the internal rating system into the bank’s day-to-day credit risk management practices;

2.3.3 To monitor the performance and risk prediction capacity of the internal rating system, regularly inspect the performance of the credit risk management department, and regularly listen to the credit risk management department’s reports about the performance and improvement of the internal rating system;

2.3.4 To report to the board of directors about the possible effects of the important revisions to the internal ratings policies and of the rating override cases; and

2.3.5 To organize and carry out training programs to enhance the bank staff’s understanding of the internal rating system.

2.4 A commercial bank shall establish an internal reporting system for internal rating purpose, with a view to ensuring that the board of directors, senior management and the credit risk management department may effectively monitor and control the changes of credit risks, and that the audit department may assess the effectiveness of the internal rating system. The bank shall determine the frequency and contents of internal reporting in accordance with the significant, type of information and the seniority of the information recipient. The reporting shall include:

2.4.1 The overall profile of credit risks based on rating results;

2.4.2 The migration across grades and asset pools;

2.4.3 The estimation of the relevant parameters in each grade or asset pool, and comparison of the realized results against expectations;

2.4.4 Validation of the internal rating system;

2.4.5 Changes to the regulatory capital levels, and reasons for the changes;
2.4.6 Scenario and results of stress testing; and

2.4.7 Information on the related internal audit.

2.5 A commercial bank shall designate a credit risk management department to take charge of the design or selection, implementation and performance of its internal rating system. The credit risk management department shall be independent from the departments responsible for credit review and extension, and the person-in-charge of the department shall directly report to the senior management and have channels to report to the board of directors. The credit risk management department shall perform the following duties:

2.5.1 To design and implement the internal rating system, take charge of or participate in the development, selection and application of the rating models, oversee the quality of the models used in the rating process, and assume ultimate responsibility for the daily review and ongoing optimization of the rating models;

2.5.2 To review the rating criteria, the implementation of the rating definitions and ability of the rating system in risk prediction, regularly submit reports on the operational performance of the internal rating system to the senior management with a view to ensuring that the senior management has sufficient information to enable effective monitoring and oversight of the day-to-day operations of the internal rating system;

2.5.3 To review and document the changes to the rating process including the reasons for the changes, and analyze and document the reasons for rating overrides and the causes for such events;

2.5.4 To organize stress tests and participate in the validation of the internal rating system; and

2.5.5 To produce the report on internal rating system, including the rating results respectively at the time of default and one year prior to
default, the analyses of migration across grades and the monitoring results of the trends in key rating criteria, and submit such report to the senior management at least twice a year.

2.6 The internal audit department of a commercial bank shall be responsible for the audit of the internal rating system and estimates of the risk parameters. It shall perform the following duties:

2.6.1 To evaluate the applicability and effectiveness of the internal rating system and test the reliability of the internal rating outputs;

2.6.2 To review the scope and quality of the functions of the credit risk management department, and evaluate the professional skills of the relevant personnel and the sufficiency of resources;

2.6.3 To check the integrity of the information system structure and data maintenance;

2.6.4 To check the data input process of the measurement models;

2.6.5 To evaluate the compliance with the requirements of the Rules;

2.6.6 To discuss with the senior management about the problems found during the course of review, and make relevant suggestions; and

2.6.7 To report to the board of directors about the review of the internal rating system at least once a year.

2.7 A commercial bank shall have in place full documentation of the governance structure for internal rating purpose, which is sufficient to support the CBRC’s evaluation of the effectiveness of the mentioned governance structure. The documentation shall as least cover the following:

2.7.1 The duties of the board of directors and its performance;
2.7.2 The duties of the senior management and its performance;

2.7.3 The duties, independence and performance of the credit risk management department;

2.7.4 The credit risk reporting system based on the internal ratings and the implementation thereof;

2.7.5 The internal audit system in relation to the internal rating system and the implementation thereof;

2.7.6 External audits of the internal rating system; and

2.7.7 The related meeting minutes, inspection reports, audit reports and other relevant information.

3. Rating System Design for Non-retail Exposures

3.1 Basic Requirements

3.1.1 A commercial bank shall determine the risk grade of each borrower and facility for non-retail exposures based on the internal ratings. The bank may adopt flexible approaches to dealing with low risk business or risk exposures that may not meet the rating conditions, but shall describe such approaches in its rating policies and file with the CBRC for record.

3.1.2 The scope of borrowers included in the internal rating of a commercial bank shall extend to all borrowers and guarantee providers. The same counterpart, regardless in the capacity as a borrower or a guarantee provider, may only have one rating.

3.1.3 A commercial bank shall separately rate all borrowers and guarantee providers of each facility that assumes credit risk.

3.1.4 A commercial bank shall rate each facility of a borrower for non-retail exposures.
3.1.5 A commercial bank may adopt the model measurement approach, or expert judgment approach, or a combination of both for internal rating purpose. The bank may choose different approach for different non-retail exposures, but shall demonstrate to the CBRC that the chosen approach may accurately reflect the risk characteristics of the borrower and facility.

3.1.6 The technical requirements for the internal rating of non-retail exposures shall include the rating dimensions, rating structure, rating methodology, rating time horizon, rating criteria, use of models and documentation.

3.2 Rating Dimensions

3.2.1 The internal rating system for non-retail exposures shall have two separate and distinctive dimensions, namely, the borrower rating and the facility rating.

3.2.2 The borrower rating shall be oriented to the risk of borrower default. It shall only reflect the risk characteristics of borrower default, irrespective of the risk characteristics of the facility. The PD of defaulted borrowers shall be 100%. The bank may assign one grade for one defaulted borrower, or assign different borrower grades based on the severity of the expected losses in accordance with the bank’s management practice.

3.2.3 Separate exposures to the same borrower shall be assigned to the same borrower grade.

3.2.4 The borrower grades shall be arranged based on the severity of the borrower’s PD in a descending order, i.e. higher grade referring lower risk. In the event that there are more than one defaulted borrower grade, the borrower grades shall be arranged by the severity of the expected loss in a descending order.
3.2.5 Where the bank adopts the Foundation IRB approach, the bank may assign the facility grade based on the expected loss which also reflects the risk of borrower default and the severity of facility loss; or the bank may assign the facility grade based on the LGD which reflects the risk of facility loss. The facility grades shall be arranged based on severity of facility loss in a descending order.

3.2.6 Where the bank adopts the Advanced IRB approach, the facility ratings shall reflect the risk of facility loss and shall be arranged based on the LGD in a descending order. The bank shall take into account all factors that can influence the LGD including, but not limited to, the product, purpose, the type of collateral. Borrower characteristics may be included in the facility rating to the extent they are predictive of the LGD. The bank may alter the factors that influence facility grades across segments of the portfolio in order to enhance the relevance and precision of its estimates.

3.3 Rating Structure

3.3.1 A commercial bank shall have adequate borrower grades and facility grades so as to effectively distinguish credit risk of different borrowers and facilities. The exposures shall be appropriately distributed across grades with no excessive concentration, on both borrower-rating and facility-rating scale.

3.3.2 A commercial bank shall, for the purpose of borrower rating, have at least seven borrower grades for non-defaulted borrowers and one borrower grade for defaulted borrowers, and shall make sure that the risk represented by a higher grade is smaller than that by a lower grade. The bank may have a greater number of borrower grades than provided by the Rules based on the characteristics of its asset portfolio and its risk management practices, provided that the setting and arrangement of the grades are consistent and stable.

3.3.3 If the risk exposure to an individual borrower grade exceeds 30% of the total risk exposures to all grades, a commercial bank
shall provide the CBRC with empirical evidence that the grade
covers a reasonably narrow PD band.

3.3.4 A commercial bank shall avoid huge differences in the LGD of
different exposures in the same facility grade. The facility rating
criteria shall be based on the empirical analysis. In the case of
significant concentration of risk exposures in a specific facility grade,
the bank shall ensure that the loss severity in the same facility grade
is identical.

3.4 Methodology and Time Horizon for Borrower Rating

3.4.1 A commercial bank may estimate the PD of borrowers through
the point-in-time (PIT) rating approach, through-the-cycle (TTC)
rating approach, and rating approach which is half way between the
aforesaid two approaches.

3.4.2 A commercial bank shall, in assigning the borrower grade, take
into account the non-systemic factors and systemic factors that may
influence the risk of default by borrowers. The bank shall explain to
the CBRC about how the systemic risk factors are incorporated into
its rating approach, and shall demonstrate the reasonableness of such
approach.

The term “non-systemic factors” refers to specific risk factors
relevant to an individual borrower. The term “systemic factors”
refers to the risk factors that are common to all borrowers, e.g.
macro-economic conditions and business cycle.

3.4.3 A commercial bank shall at least estimate the PD of borrower
in the future one year.

3.4.4 A commercial bank shall, when assigning a borrower grade,
take into account the current risk characteristics of borrowers, as
well as the effects of economic downturns and adverse industrial
changes on the borrowers’ ability and willingness of repayment, and
shall reflect the borrowers’ risk sensitiveness through stress testing. If the data is limited or if it is difficult to predict the effects of future events on the borrowers’ financial conditions, the bank shall make conservative estimation.

3.5 Rating Criteria

3.5.1 A commercial bank shall have in place the rating definitions, processes and criteria in writing. The rating definitions and criteria shall be reasonable, clear and may provide a meaningful differentiation of risks. The rating definitions shall include descriptions about the risk severity in each grade and the criteria for differentiation of risks of different grades. The rating criteria shall be consistent with the bank’s policies on credit, disposal of bad loans and etc..

3.5.2 The rating criteria adopted by a commercial bank shall take into account all important information relevant to the borrower and facility ratings. The less information the bank has, the more conservative shall it be in borrower and facility ratings.

3.5.3 A commercial bank shall ensure that the rating definitions are detailed and operable so as to allow the operational staff to reasonably differentiate borrowers and facilities. The rating criteria shall be consistent across different lines of business, departments and geographic locations. If there is any discrepancy, the bank shall monitor for possible comparability between the rating outputs, and shall improve the rating criteria in a timely manner.

3.5.4 When adopting a rating approach based on expert judgment, a commercial bank shall ensure the clarity and transparency of the rating criteria to enable the CBRC and internal audit department or any third party to understand the rating approach, replicate rating process and evaluate the appropriateness of the grade assignments.
3.5.5 A commercial bank may use the result of external rating in its internal rating, but shall not rely solely on the external rating, and shall satisfy the following requirements:

3.5.5.1 Having good knowledge of the risk factors considered and the rating criteria adopted in the external rating of a facility so as to ensure the consistency between the structures of external rating and that of internal rating;

3.5.5.2 Being able to analyze the predictive power of external rating of a facility; and

3.5.5.3 Having assessed the influence of use of external rating on the internal rating.

3.6 Use of Models

3.6.1 The credit risk measurement models shall play an important role in the estimation of default characteristics and loss characteristics. As a credit risk measurement model uses only partial information, a commercial bank shall, through necessary expert judgment, make sure that the internal rating assignments have considered all relevant information. The expert judgment shall consider the relevant information not covered by the models. The commercial bank shall have written guidelines describing how expert judgment and model outputs are to be combined.

3.6.2 A commercial bank shall demonstrate that the data used to build measurement models reflect the scale and characteristics of asset portfolios and shall have the procedures for regular evaluation of the accuracy, integrity and appropriateness of the data used to build measurement models, and make sure the application of risk parameters that are based on the model-building data to the credit portfolio management.
3.6.3 A commercial bank may establish multiple rating systems in line with its business complexity and risk management capability. The bank shall validate the accuracy and consistency of such rating systems.

3.6.4 A commercial bank shall make regular model validation, which includes the monitoring of model differentiating power, predictive power, accuracy and robustness; review of model relationships; and testing of actual model outputs against expected outcomes. A commercial bank shall have the ability to assess the limitation of model, examine and control the error of model, improve the performance of the models in an on-going manner.

3.6.5 A commercial bank shall have full knowledge of the basic assumptions on which the rating models are based and assess the consistency between the assumptions and the real economic conditions. When the economic conditions change, the bank shall ensure that the current models are appropriate to the post-change economic environment and the differences in the model outputs are within the controllable range. If the model outputs do not satisfy the aforesaid requirements, the bank shall make conservative adjustments to the model outputs.

3.7 Documentation

3.7.1 A commercial bank shall document in writing the design of internal ratings for non-retail exposures and establish documentation conforming to the requirements of the Rules.

3.7.2 A commercial bank shall document in writing the important internal rating process, at least including:

3.7.2.1 The rating objectives;

3.7.2.2 The categorization of asset portfolio;
3.7.2.3 The applicability and rationale for the choice of exposure rating systems; and

3.7.2.4 The role of internal ratings in credit risk and portfolio management.

3.7.3 A commercial bank shall document in writing the rating criteria and the definitions of each grade, which shall at least include:

3.7.3.1 The rating approaches and data;

3.7.3.2 The basis for determining the structure of the grades of borrower rating and facility rating, and the grade definitions, which shall include the number of grades of borrower rating and facility rating, the distribution of borrowers and facilities of different grades, etc.;

3.7.3.3 The relationship between borrowers of different grades based on risks, and the risk of each grade as determined in light of the PD of borrower grades;

3.7.3.4 The relationship between the facilities across different grades based on risks, and the risk of each grade as determined in light of the expected loss severity;

3.7.3.5 The basis and procedures for the selection of rating criteria to enable the analysis of the internal ratings’ power to differentiate risks; the basis and procedures for the selection of each rating approach in the case of adoption of multiple rating approaches; and

3.7.3.6 The definitions of default and loss.

3.7.4 A commercial bank shall have complete documentation of the methodology, scope of use of the model, etc. The documents shall as least include:
3.7.4.1 A detailed description of the theory, assumptions and/or mathematical and empirical basis of the assignment of estimates to grades, individual borrowers, exposures or pools, and source(s) of the data used to build the model;

3.7.4.2 Information about the validation of the representative nature of the data used to build the model for credit portfolios;

3.7.4.3 Information about validation of the model by employing the statistical approaches, including out-of-time and out-of-sample performance tests; and

3.7.4.4 The circumstances under which the models fail to work effectively, and the related solutions.

3.7.5 The external models to be adopted shall also meet the documentation requirements as described in the Rules.

4. Design of Asset Pool Assignment System for Retail Exposures

4.1 Basic Requirements

4.1.1 A commercial bank shall establish an asset pool assignment system for retail exposures and develop written policies with a view to accurately and reliably distinguishing each retail exposure and assigning the exposure into the corresponding asset pool.

The asset pool assignment policies of the bank shall provide a detailed description of ways of managing some special retail exposures, including products that are no longer promoted but still exist, as well as new products for which there are no asset pool assignment approaches and criteria for the time being, etc..

4.1.2 A commercial bank shall, based on risk analysis, categorize the defaulted and non-defaulted retail exposures separately, and categorize retail exposures to different countries separately.
However, where the bank can prove the risks of retail exposures to different countries are homogenous and with the approval of the CBRC, the underlying exposures may not be assigned to separate asset pools.

4.1.3 A commercial bank shall choose reliable risk factors for asset pool assignment and simultaneously use these factors in the management of credit risk of retail exposures. When choosing risk factors, the bank may employ statistical models or expert judgment or a combination of both.

4.1.4 The asset pool assignment for retail exposures shall simultaneously reflect the primary risk characteristics of the borrowers and those of facilities. The retail exposures in a same pool shall reflect the risks with similar characteristics, including but not limited to the following factors:

4.1.4.1 The borrower risk characteristics, including the type and demographics of borrowers, such as income, age, occupation, credit grades of clients, regions, etc.;

4.1.4.2 The facility risk characteristics, including the risk characteristics of products and collaterals, e.g. type of mortgage and/or pledge, proportion of mortgage and/or pledge, guarantees, seniority, book age, etc.; and

4.1.4.3 Information about delinquency of exposure.

4.1.5 A commercial bank shall ensure that sufficiently homogenous risk exposures are grouped in each asset pool and may be used to accurately and consistently estimate the PD, LGD and EAD of this pool.

4.1.6 A commercial bank may choose the asset pool assignment approaches at their own discretion, provided that the risks are effectively differentiated. The asset pool assignment approaches of
the bank shall ensure the robustness and consistency of the pools. In the event that the retail exposures are frequently adjusted across asset pools, the bank shall review the asset pool assignment approaches.

4.1.7 A commercial bank shall ensure an appropriate distribution of retail exposures across asset pools so as to avoid excessive concentration of retail exposures in any individual pool. If the risk exposures in an individual asset pool exceed 30% of the total retail exposures in such category, the bank shall demonstrate to CBRC that the risk exposures in this asset pool are homogenous and will not affect the risk parameters used to estimate the pool.

4.1.8 For residential mortgage exposures and qualified revolving retail exposures, a commercial bank shall at least once a year re-determine the asset pool assignment of existing customers, and, according to the criteria of classifying the small businesses into retail exposures standards, at least once a year re-determine the list of small business classified into retail exposures.

4.1.9 The technical requirements for asset pool assignment of retail exposures shall include assignment approaches, criteria and documentation.

4.2 Asset Pool Assignment Approaches

4.2.1 A commercial bank shall choose the proper asset pool assignment approaches based on the available data, and assign each risk exposure into the corresponding asset pool according to such risk factors as the rating and book age, or according to such risk parameters as PD, LGD and EAD.

4.2.2 Where the data for a retail exposure is the absent, a commercial bank shall make full use of the data available and offset the weakness of data deficiency through the design of asset pool
assignment system. The extent of data deficiency shall be reflected in the assignments of asset pools.

4.2.3 When a commercial bank estimates the risk parameters of retail exposures by employing a credit rating model or any other credit risk measurement model, the use of relevant models shall satisfy the Rules.

4.3 Asset Pool Assignment Criteria

4.3.1 A commercial bank shall have in a written form asset pool definitions and asset pool assignment procedures, approaches and criteria. The relevant provisions shall be clear, intuitive and detailed so as to ensure that retail exposures of the same credit risk characteristics are assigned into the same asset pool.

The asset pool assignment criteria of the bank shall be consistent with the policies of retail business management. The asset pool assignment outputs shall be consistent with the long-run experience.

4.3.2 A commercial bank shall ensure the consistency of asset pool assignment criteria for retail exposures across business lines, departments and geographic locations. Where the rating criteria and procedures differ for different types of borrowers or facilities, the bank shall monitor the comparability of the risk categorization results and alter rating criteria to improve consistency when appropriate.

4.3.3 A commercial bank shall ensure the transparency of the asset pool assignment criteria so as to allow the CBRC, the internal audit department and any other third party to understand the asset pool assignment approaches, replicate the assignment process, and evaluate the appropriateness of asset pool assignments.
4.3.4 All the relevant information as described in the Rules shall be taken into account in asset pool assignment.

The borrowers’ ability and willingness of repayment in the adverse economic conditions or at the occurrence of unexpected events shall be included in the consideration of the borrower default characteristics. When it is difficult for a commercial bank to forecast future events and their influence on the borrower’s financial condition, the bank shall take a conservative view of projected information. Where the data is limited, the bank shall adopt a conservative bias to its analysis.

4.3.5 A commercial bank shall use the data with a time horizon longer than one year and use the current data as much as possible so as to ensure the accuracy and robustness of asset pool assignment. The less information the bank has, the more conservative the bank shall be in asset pool assignments.

4.4 Documentation

4.4.1 A commercial bank shall document in writing the design of asset pool assignment of retail exposures and develop documentation that conforms to the requirements of the Rules.

4.4.2 A commercial bank shall document in writing the approaches and criteria for asset pool assignment, which shall at least include:

4.4.2.1 The approaches, data and rationale used in the asset pool assignment;

4.4.2.2 The basis for the asset pool determination and asset pool definitions, including the number of asset pools, distribution of risk exposures across pools, approaches for the selection of risk factors, models and selected risk characteristics;
4.4.2.3 The analysis of the homogeneity and concentration of risks in asset pools, the appropriateness and consistency of risk categorization, etc. The bank shall record the migration of risk exposures across the asset pools, and the basis for revising the asset pools and risk asset pool assignment, and other relevant information; and

4.4.2.4 The definitions of default and loss.

4.4.3 Where a commercial bank uses measurement model(s) in the asset pool assignment, it shall have complete documentation of the methodology and scope of use of the model, etc. The documentation shall as least include:

4.4.3.1 A detailed description of the methodology, assumptions, mathematical and empirical basis of asset pool assignment, and source(s) of the data used to build the model;

4.4.3.2 Information about the validation of the representative nature of the data used to build the model for retail exposures;

4.4.3.3 Information about validation of the model by employing the statistical approaches, including out-of-time and out-of-sample performance tests for validating the model; and

4.4.3.4 The events in which the effectiveness of the model is constrained, and solutions of the commercial bank.

4.4.4 The external models employed shall also satisfy the documentation requirements of the Rules.

5. Internal Rating Procedures

5.1 Basic Requirements
5.1.1 A commercial bank shall develop sound internal rating processes so as to ensure the independence of the internal ratings of retail exposures and asset pool assignment of non-retail exposures.

5.1.2 The internal rating process includes initiation, verification, override and update of ratings. It shall be reflected in the credit policies and credit management procedures of a commercial bank.

Basically, the asset pool assignment of retail exposures is not allowed to be overridden. If a commercial bank allows overrides, it shall develop written policies and procedures and demonstrate to the CBRC the necessity of override and evidence of being prudent in this respect.

5.1.3 A commercial bank shall establish a management information system so as to ensure the reliable operation of the internal rating procedures, and shall record the whole rating process in detail so as to ensure the effective execution of the operational procedures for the borrower/facility ratings for non-retail exposures and asset pool assignment for retail exposures.

5.1.4 A commercial bank shall have complete documentation so as to ensure the standardization and optimization of the internal rating process, and demonstrate that the operations of the internal rating system meet the requirements of the Rules. The documentation shall as least include:

5.1.4.1 The rationale for the design of the rating process;

5.1.4.2 The organizational structure, design of functions and respective duties;

5.1.4.3 The policies and operational procedures for the initiation, verification, overrides and update of ratings;
5.1.4.4 Measures for rating management, including the management’s oversight responsibility over the rating review department;

5.1.4.5 The policies on the exceptional events;

5.1.4.6 The guiding principles and monitoring of the measurement models-based internal ratings;

5.1.4.7 The requirement documents for internal rating IT system; and

5.1.4.8 Other information, including, but not limited to, the major changes to the operational procedures of the internal rating system, and the major changes since the latest inspection by the CBRC.

5.2 Initiation of Ratings

5.2.1 The term “initiation of a rating” refers to a new process during which the rating function rates a borrower or facility.

5.2.2 A commercial bank shall develop rating initiation policies, including, but not limited to, arrangement of the function for rating initiation, the scope of borrowers and facilities, frequency and operational procedures for the initiation of ratings.

5.2.3 A commercial bank shall formulate relevant authorization procedures for the initiation of rating of the same borrower or facility by different departments.

5.2.4 People who initiate a rating shall, in compliance with the principle of due diligence, fully and accurately collect various data as needed in the rating, examine the genuineness of the materials, and input relevant data to the credit rating system in a complete and correct manner.
5.2.5 The principles of objectiveness, independence and prudence shall be observed in the initiation of rating. The credit rating quality shall be ensured on the basis of credit analysis and in pursuance of the exiting criteria and procedures.

5.3 Verification of Ratings

5.3.1 The term “verification of ratings” refers to the process during which the rating verification function reviews the ratings suggested by the rating function and determines the ultimate ratings.

5.3.2 A commercial bank shall arrange a rating verification function to review the suggested ratings and determine the ultimate credit ratings. The rating verification function shall satisfy the independence requirements. None of the persons who verify the ratings shall directly benefit from the extension of loans, be influenced by the relevant interested persons or be concurrently the person who initiates a rating.

5.4 Rating Overrides

5.4.1 The rating overrides include both the overrides of the measurement model-based rating outputs by the rating function and the denial of the suggested ratings by the rating verification function.

5.4.2 A commercial bank shall have clearly defined policies and procedures for the rating override, including, but not limited to, the rating override basis, conditions, empowerment, extent, output processing, documentation.

5.4.3 Where its internal rating system is based on measurement models, a commercial bank shall monitor the cases where expert judgment has overridden the model’s rating, variables are excluded or parameters are adjusted, and formulate corresponding guiding principles.
5.4.4 Where its internal rating system is based on expert judgment, a commercial bank shall clearly articulate the situations in which bank officers may override the outputs of the rating, including how and to what extent such overrides may be used, and by whom.

5.4.5 A commercial bank shall establish complete rating override documentation, record in detail the reasons for, outputs and performance of the rating overrides.

5.5 Update of Ratings

5.5.1 A commercial bank shall have written policies for rating update, including the rating update conditions, frequency and procedures, and the valid term of a rating.

5.5.2 A commercial bank shall update the ratings of borrowers and guarantors for non-retail exposures at least once a year. For a borrower with a relatively high risk, the bank shall properly increase the update frequency.

5.5.3 A commercial bank may, in light of the needs in the internal risk management, determine the frequency for updating the facility ratings, and shall update the facility ratings at least once a year. For a facility with a relatively high risk, the bank shall properly increase the update frequency.

5.5.4 A commercial bank shall have effective procedures to obtain and update such important information as borrowers’ financial conditions, and facility characteristics. If the information obtained meets the rating update requirements, the bank shall finish the rating update within three months. In the event that necessity arises to update a rating during the valid term of rating, the rating frequency shall not be subject to the once-a-year limitation and the valid term of rating shall be recalculated as of the date of rating update.
5.5.5 A commercial bank shall monitor on an on-going basis the changes in the characteristics of each risk covered by retail exposures and shall migrate the retail exposures in a timely manner to the corresponding asset pool in light of the latest information.

5.5.6 A commercial bank shall determine the frequency for checking the updates, on the basis of the product and risk characteristics, time horizon for the risk estimation, and the retail business risk management policies. A commercial bank shall check the loss characteristics and delinquency status of each asset pool at least annually, and make sample check on the individual borrowers in the asset pool as well as the related loans at least on a quarterly basis.

6. Quantification of Risk Parameters

6.1 Basic Requirements

6.1.1 The term “quantification of risk parameters” refers to the process during which a commercial bank estimates the credit risk parameters for the IRB approach. For non-retail exposures, banks adopting the Foundation IRB approach shall estimate the PD and banks adopting the Advanced IRB approach shall estimate the PD, LGD, EAD and maturity. For retail exposures, commercial banks shall estimate the PD, LGD and EAD.

6.1.2 A commercial bank shall, in accordance with the requirements of the Rules, develop risk parameter quantification policies, processes and key definitions, and shall ensure that they are implemented in a uniform and consistent manner throughout the bank.

6.1.3 A commercial bank shall estimate the PD, LGD and EAD with all the available data, information and approaches.

6.1.4 The estimates of PD, LGD, EAD shall be based on the historical experience and empirical research rather than solely based
on expert judgment. A commercial bank shall make empirical analysis of the expert judgment and adjustments in the process of quantification of risk parameters so as not to underestimate the risk. The adjustment decisions, basis and calculation methods shall be documented and be kept on record so as to facilitate the internal oversight and continuous improvement as well as ensure that the internal oversight and inspection may track the whole process. The bank shall make sensitivity analysis to assess the effects of the adjustments on the risk parameters and regulatory capital.

6.1.5 A commercial bank shall formulate policies for updating risk parameter quantification so as to ensure that technical progress, and changes of data, information and estimation approaches are timely and fully reflected by the risk parameters. The bank shall check the estimates of its internal risk parameters at least once a year. It shall timely update the quantification approaches and procedures required by business need.

6.1.6 The principle of prudence shall be followed in the estimation of PD, LGD and EAD. A commercial bank shall add to its estimates of risk parameters a margin of conservatism that is related to the likely range of errors. The larger the likely range of errors is, the more conservative the estimation should be.

6.1.7 As to retail exposures, if a commercial bank may prove that there is no material difference between the LGD characteristics of different asset pools, these asset pools may use the same risk parameter estimates.

6.1.8 The process of quantification of risk parameters and the adjustment to the estimates of risk parameters shall be timely reported to the CBRC for record.

6.1.9 A commercial bank shall have complete documentation for risk parameter qualification so as to improve the process of risk
parameters quantification on an ongoing basis and provide support
to the supervision and inspection by the CBRC.

6.2 Procedures for Quantification of Risk Parameters

6.2.1 A commercial bank shall have in place written procedures for
the quantification of risk parameters so as to ensure prudent
estimation of risk parameters. The procedures for the quantification
of risk parameters shall include four steps, i.e. data selection,
estimation, mapping and application of parameters.

6.2.2 A commercial bank shall select eligible data from the historical
data to build a sample data set. The data selection shall meet the
requirements of the Rules.

6.2.3 The sources of data for the sample data set may include the
internal data, the external data, and the pooled internal and external
data, so as to ensure that the estimates are based on all relevant and
material data. When using external data, a commercial bank shall
ensure the comparability, correlation and consistency between the
external data and the internal data.

6.2.4 A commercial bank shall ensure the consistency of relevant
data definitions. In the data used for estimation of risk factors, the
number of exposures, the credit criteria for the generation of data
and other relevant characteristics shall be consistent with the risk
exposures and credit criteria of the commercial bank, or at least be
comparable one against the other.

6.2.5 The sample data selected by a commercial bank shall be
representative, and shall be able to reflect the characteristics of
credit risk exposures, bank’s credit policies, as well as current and
future economic conditions. The number and time period of the
sample data to be selected shall ensure the accuracy of the estimates
of risk parameters.
6.2.6 The observation period of risk parameters quantification shall cover a complete economic cycle. The length of the observation period of the data used for estimation of PD of borrowers for non-retail exposures shall be at least five years, the length of the observation period used for estimation of LGD and EAD for non-retail exposures shall be at least seven years. The length of observation period of data used for estimation of risk parameters for retail exposures shall be at least five years. If a commercial bank may obtain historical data that spans a longer time horizon, the bank shall adopt a longer historical observation period. The shorter an observation period is, the more conservative the estimates of the commercial bank shall be.

6.2.7 The historical data at different stages shall be of equal importance. If the empirical experience of a commercial bank shows that the historical data at certain stage may better reflect the impact of the economic cycle and is helpful to the accurate estimation of parameters, the commercial bank may, upon approval by CBRC, make an exception when using such data.

6.2.8 A commercial bank may use external data, internal data, pooled internal and external data or any combination of the aforesaid three data sources, but the length of the observation period of at least one of the data sources shall not be shorter than what is required in the Rules.

6.2.9 A commercial bank may, prior to the implementation of the IRB approach, have certain flexibility in the data collection criteria, but shall make related adjustments when using such data, and shall demonstrate to the CBRC that there is no material difference between the post-adjustment data and other data.

6.2.10 A commercial bank shall make an overall analysis and review of the sample data set at least every year so as to ensure the correlation between the sample data and the existing portfolios, the quality of estimates of sample data, as well as the consistency
between the sample data and the definition of default. If there is any severe deficiency in the sample data or in the existing risk exposure portfolio data or if any important information is missing, the commercial bank shall clarify in writing the methods to address the deficiency as well as the related adjustments.

6.2.11 A commercial bank shall estimate the risk parameters on the basis of the risk characteristics and performance of the sample data. The parameter estimates shall meet the requirements of the Rules.

6.2.12 A commercial bank shall analyze sample data set with different risk characteristics and estimate their respective risk parameters by using statistical methods. The bank may estimate the risk parameters with one or multiple statistical methods. When there are several estimation outputs, the bank shall integrate the risk parameter estimates based on external and internal data with those based on different models. The bank shall set forth clear and consistent policies to integrate the estimation outputs based on different data and different measurement models and check sensitivity of different integrations to the estimation outputs.

6.2.13 When using internal data, external data or pooled internal and external data, a commercial bank shall prove that the parameter estimates are representative of long-term experience. The parameter estimation shall reflect the changes to the loan extension policies and changes to the loan recovery procedures of the commercial bank during the observation period of data.

6.2.14 PD estimates shall be a long-run average of one-year default rates for borrowers in a specific grade or in a specific retail asset pool. The LGD and EAD shall be long-run default-weighted averages.

6.2.15 A commercial bank may take into account the risk mitigation role of eligible guarantors and credit derivatives in making adjustment to the borrower’s ratings, retail asset pools and LGD.
6.2.16 If the time horizon for the sample data does not include period of economic downturns, the parameter estimates shall be adjusted so as to offset the effects of data absence.

6.2.17 A commercial bank shall map the sample data into the real risk exposure portfolios. The mapping shall satisfy the requirements of the Rules.

6.2.18 A commercial bank shall have a mapping process for each sample data set and each estimation model, reflecting the risk characteristics used by each sample data set or measurement model.

6.2.19 In order to ensure the effectiveness of mapping, the rating structure and classification criteria for sample data shall be consistent with the actual risk exposures. If the exposure classification criteria of the commercial bank changes, the bank shall map the sample data sets to the existing classification criteria so as to prove the correctness of the mapping.

6.2.20 The mappings shall be based on the most common and most meaningful risk characteristics between the actual exposure portfolios and the sample data sets.

6.2.21 Where a commercial bank uses the internal default experience and statistical default models to estimate their respective long-run PD, it shall map each approach to the actual risk exposures.

6.2.22 A commercial bank shall apply the risk parameters based on the estimates of sample data sets to the actual asset portfolios.

6.3 PD Estimation and Requirements

6.3.1 A default is considered to have occurred with regard to a particular borrower when either of the following events takes place:

6.3.1.1 Any of the borrower’s material credit obligations to the bank groups past due for 90 days or more. Overdrafts will be considered
as being past due once the borrower has breached a prescribed overdraft limit or its verified limit is smaller than current balances.

6.3.1.2 The commercial bank considers that a borrower may fail to pay its credit obligations to the bank in full, unless recourse actions by the bank are taken, such as realizing collaterals. When any of the following events takes place, the bank shall consider that a borrower “may fail to pay its credit obligations to the commercial bank in full”:

Firstly, the bank stops calculating the interests of any of the credit obligations or integrates the accrued interests thereof into the off-sheet calculation;

Secondly, owing to the deterioration of financial conditions of the borrower, the bank makes a charge-off or provision at a certain rate for the loan loss after the establishment of a credit relationship;

Thirdly, the bank sells the credit obligation which incurs material credit-related book losses;

Fourthly, owing to the deterioration of financial conditions of the borrower, the bank consents to a distressed restructuring of the credit obligation and make non-commercial adjustments to the terms and conditions of the credit contract, including but not limited to such cases as: (a) reduced debt obligation caused by changes to the contractual terms and conditions; (b) repaying the old debt obligation with new loans because of the borrower’s inability to pay off; and (c) granting of extension because of the borrower’s inability to pay off its facilities;

Fifthly, the bank has filed for the borrower’s bankruptcy or a similar order;
Sixthly, the borrower has applied for or has been placed in bankruptcy or similar protection where this would avoid or delay the repayment of its debt obligation to the bank; and

Seventhly, other events where the bank affirms the inability of the borrower to pay back its credit obligations in full.

6.3.2 A commercial bank shall, by referring to the aforementioned events, have in place the uniform definitions of default and clearly defined default identification process, and ensure the consistent implementation throughout the bank. In the definitions of default, the bank shall prudently set out the criteria on material credit obligations, proportion of loan loss provisioning that triggers default, proportion of loan sales loss, proportion of diminished financial obligation as a result of distressed debt restructuring, etc.

The bank shall integrate the definitions of default into its information system, record in detail the reasons of default, and accumulate the default data.

6.3.3 For non-retail exposures, where a borrower is considered to have defaulted, a commercial bank shall check the ratings of all borrowers related to this borrower and assess their ability to repay their debts. Whether cross-default is to be determined against the related borrowers depends on the related borrowers’ financial interdependence and integration. The bank shall, in internal rating policies, clearly articulate the rating approaches for enterprise groups and ensure that such approaches be employed consistently.

6.3.3.1 In case internal rating is based on the entire enterprise group and credit is extended according to the rating of the enterprise group, default of any borrower within the group shall be deemed as a trigger of default of all borrowers within the group; and

6.3.3.2 In case internal rating is based on an individual enterprise rather than the enterprise group, default of any borrower within the
group will not necessarily trigger default of other borrowers. The bank shall check the rating of the enterprise-affiliated borrowers in time and decide whether to adjust the rating.

6.3.4 A commercial bank shall formulate the policies for re-determining the book age and ensure the consistent implementation of the policies. In making such policies, the bank may calculate the days of facility past due according to the re-determined book age (including loan extension and the delay in repayment, etc). The policy of re-determining the book age shall at least include:

6.3.4.1 The person that approves the re-determination of the book age and the requirements of the report;

6.3.4.2 The minimum book age of the facility prior to the book age re-determination;

6.3.4.3 The past due of the facility for which the book age is to be re-determined;

6.3.4.4 The maximum amount of book age re-determination for each facility; and

6.3.4.5 Re-evaluation of borrower’s repayment ability.

6.3.5 A commercial bank shall meet the following conditions when applying the re-aging to the following specific risk exposures:

6.3.5.1 With respect to the overdraft, the overdraft balance must be reduced to be smaller than the credit limit.

6.3.5.2 The past due portion of a non-retail revolving exposure must be repaid in full.

6.3.5.3 With respect to the revolving retail loan for which the un-repaid balance of the last period is transferred into the repayment
balance of the next period, the minimum repayment limit of the last period shall be repaid in full; and

6.3.5.4 With respect to the installment loan, the loan with the longest past due period (including the principal, interest payments and penalty interest) shall be repaid in full.

6.3.6 A commercial bank shall record actual default of various assets and estimate the PD according to the definitions of default.

6.3.7 For non-retail exposures, default shall be identified on the level of borrower, and the PD of one borrower’s all facilities shall be identical; for retail exposures, default shall be identified on the level of facility, and the PD of one borrower’s all facilities may be different.

6.3.8 The data shall reflect changes of the borrower’s default risks in the entire economic cycle including the economic downturns. In case the data do not include the economic downturns, a commercial bank shall adjust the method of estimation or estimated outputs of the PD.

6.3.9 In case of any discrepancy between sample data and the definitions of default, a commercial bank shall adjust the sample data.

6.3.10 A commercial bank shall employ proper information, methods and consider long-term default experience when estimating the average PD of each grade. The bank shall adopt an estimation technique in consistency with the data basis to ensure that the estimation accurately reflects the PD. The bank may adopt such techniques as internal default experience, mapping external data and statistical default models to estimate the average PD. The bank may choose a major technique, which will be affiliated by other techniques for comparison, and make proper adjustments. In view of the limitation of both information and techniques, the bank may adjust the estimated outputs by using expert judgment.
6.3.10.1 Internal default experience. A commercial bank may estimate the PD by using internal default experience. The bank shall prove that the estimated PD reflects the credit standard as well as the discrepancy between the data-generation rating system and the current rating system. In case of limited data or changes in credit standard or rating system, conservative allowances for major adjustment shall be reserved by the bank. The bank may adopt data collected by other banks, but shall demonstrate that the internal rating systems and standards of other commercial banks in the risk exposure pools are comparable with this bank.

6.3.10.2 Mapping external data. A commercial bank may map internal ratings to ratings by external rating agencies or institutions alike, and use the PD of external ratings as that of internal rating. Rating mapping shall be established on the basis that the internal rating standards are comparable with external agencies’ rating standards and that internal rating is comparable with external rating of the same borrower. The bank shall avoid discrepancy and inconsistency of the mapping methods or basic data. The external rating adopted to quantify risk data shall be tailored for the default risk of borrowers, rather than reflect the facility characteristics. The bank shall compare the definitions of default of internal rating and external rating and establish documents of internal and external rating mapping.

6.3.10.3 Statistical default models. With respect to a borrower of any grade, a commercial bank may use the average value of each borrower’s PD calculated with PD estimation model as the PD of the grade, and the PD model adopted by the bank shall satisfy the requirements relevant to the use of models as prescribed in the Rules.

6.3.11 A commercial bank may use borrower mapping or rating grade mapping for non-retail risk exposures. In borrower mappings, each borrower’s risk characteristics shall be mapped into the sample
data sets. Rating grade mapping will homogenize risk characteristics of borrowers of the same grade, or construct a typical or representative borrower for each grade, and then map the representative borrower with sample data.

6.3.12 The time horizon for calculation of PD is usually one year. To assess the risk level of long-term loans, a commercial bank may adopt accumulated PD of different time horizons, such as three years and five years, to determine the borrower’s grade.

6.3.13 With respect to retail exposures, in the event a commercial bank has a specific data base to classify the exposures into different asset pools, the internal data shall be taken as the basic information source for estimating the loss characteristics. In the event that a commercial bank can prove the high correlation between the pool assignment process and external data source, as well as close links between internal risk exposures and external data, the adoption of external data is allowed to quantify risks. In any case, the bank shall use all relevant important data to compare internal and external outputs.

6.3.14 When a commercial bank estimates the PD of a borrower exposed to retail risks with measurement models, the input parameters of the models shall take into account such factors as the borrower’s risk characteristics, maturity of loans, as well as macroeconomic and industry-specific variables.

6.3.15 In case a commercial bank believes that the book age is an important risk factor for certain retail risk exposure, and the PD has seasoning effect, the estimated PD shall reflect the seasoning effect of risk exposures during a relatively long period, and the bank shall upgrade the PD where appropriate to ensure the sufficiency of capital to absorb potential credit loss.
6.3.16 Despite the fact that retail risk exposures have seasoning effect, a commercial bank may neglect the seasoning effect under any of the following circumstances:

6.3.16.1 The bank plans and is able to sell or securitize the asset within 90 days;

6.3.16.2 The exposures have been specially identified when the credit is extended; and

6.3.16.3 The bank is able to trace the trading market and securitization market continuously, estimate counterparty risks and sell or securitize the exposures under different market conditions.

6.3.17 Where the important default factors not covered in a commercial bank’s retail assets pool assignments and the PD estimation models, such as industrial and regional factors, the bank shall take into account these factors in mapping process and make proper adjustments. The adjustment process shall be transparent and integrate the above-mentioned factors into asset pool assignment and default estimation models.

6.4 LGD Estimation and Requirements

6.4.1 The LGD refers to the proportion the loss incurred by a single defaulted facility in the exposures of this defaulted facility, i.e. the percentage of loss in the total amount of risk exposures.

6.4.2 The LGD estimate shall be based on economic losses, which include direct or indirect major losses or costs resulting from borrower's default. The time value of defaulted facility’s recovered amount and the influence of a commercial bank’s disposal and recovery ability on loan repayment shall also be considered.

6.4.2.1 Direct losses or costs refer to losses or costs that may be attributed to certain facility, including, but not limited to, principal and interest losses, collateral recovery costs or lawsuit costs.
6.4.2.2 Indirect losses or costs refer to losses or costs that are incurred by a commercial bank’s management or recovery of defaulted facilities but may not be attributed to a specific facility. The bank shall amortize indirect losses or costs through appropriate means.

6.4.2.3 A commercial bank shall discount repayment amount of defaulted facility to the time point of default to truly reflect the economic losses. The discount rate used by the bank shall reflect the costs of defaulted facility held during the recovery period. When determining the discount rate, the bank shall consider the following factors:

Firstly, in case the amount to be recovered is unfixed with indispensable risks, the calculation of net present value (hereinafter referred to as “the NPV”) shall reflect the time value of the recovered amount and the corresponding risk premium, which shall reflect the situation of economic downturns.

Secondly, in case the amount to be recovered is fixed, the calculation of NPV only needs to reflect the time value of the recovered amount. Risk-free discount rate is a possible choice.

6.4.3 A commercial bank shall consider all relevant factors when estimating economic losses. When adjusting the LGD according to the bank’s disposal and recovery ability, the bank shall abide by the principle of prudence, and the internal experience data shall prove the influence of disposal and recovery ability on LGD.

6.4.4 The LGD shall not be lower than the long-run default-weighted average loss rate. The long-run default-weighted average loss rate refers to the economic loss rate of defaulted risk exposure when a default occurs to a borrower under mixed economic conditions. Mixed economic conditions shall include economic downturns. The long-run average loss rate shall be based on the average economic
loss of all defaulted loans from the same category of loan data source.

6.4.5 The LGD shall reflect the severity of loss of defaulted facility during economic downturns to ensure that the estimated value of the default loss is steady and reliable under all foreseeable economic conditions. A commercial bank shall formulate relevant policies, identify economic downturns, analyze the influence of economic downturns on the severity of losses, and rationally estimate the LGD. These policies shall include, but are not limited to, the standards and data requirements of economic downturns for different products and regions, the methods to judge the influence of economic downturns on the severity of losses, and measurement methods of LGD.

6.4.6 The data used to estimate the LGD shall only include the risk exposures of defaulted borrowers. A commercial bank shall collect key factors to differentiate default exposures, as well as factors to calculate economic losses of EAD, including, but not limited to:

6.4.6.1 Important factors influencing the LGD of non-retail exposures, including mortgages and pledges, guarantees, economic environment, and borrower’s occupation, etc.

6.4.6.2 Important factors influencing the LGD of retail exposures, including the credit scoring, products, geographic locations, non-secured credit line, mortgage rate of housing mortgage loans, type of risk exposures, time of establishing relationship with the clients, and financial conditions of the borrower’s, etc.

6.4.6.3 Where a commercial bank adopts different methods to estimate economic losses, the data needed by the bank shall be different. A commercial bank may use EAD or market value of the written-off assets to calculate the recovery rate; or use such factors as EAD (including principal and accrued interest receivables and fees), collateral disposal loss, direct recovery cost, amortized
indirect recovery cost, recovery time, recovery amount and discount rate to calculate the actual economic losses.

6.4.7 To estimate LGD, a commercial bank shall take into account the actual recovery amount and the associated cost the bank has already paid. In case a commercial bank has not been fully repaid by the borrower, the bank shall determine the deadline to complete the loan repayment. The selection of deadline for complete repayment shall be fully accounted and documented.

6.4.8 A commercial bank shall incorporate the cyclical variability in loss severities into its LGD estimates.

6.4.9 A commercial bank shall consider the correlation between the risk of the borrower and that of the collateral or collateral provider. When there is a high correlation, the bank shall make a conservative estimation. In case of currency mismatch between the underlying obligation and the collateral, the bank shall also make conservative estimation of LGD.

6.4.10 Estimation of LGD shall be based on historical recovery rates, rather than solely based on the estimation of market value of collateral. To estimate LGD, a commercial bank shall consider its ability to gain both control of the collateral and liquidate the collateral expeditiously. If the factor of collateral is considered in LGD estimation, the collateral shall meet the recognition standards in the Rules.

6.4.11 A commercial bank shall consider the fact that the realized losses can at times systematically exceed expected levels, and the LGD assinged to a defaulted asset should reflect the possibility that the bank would have to recognize additional, unexpected losses during the recovery period. For each defaulted asset, the bank should also construct its best estimate of the expected loss on that asset based on current economic circumstances and facility status. The amount, if any, by which the LGD on a defaulted asset exceeds the
bank’s best estimate of expected loss on the asset represents the capital requirement for that asset. Instances where the best estimate of expected loss on a defaulted asset is less than the sum of specific provisions and partial charge-offs on that asset shall be justified by the bank. When the facility loss is significantly higher than the average level, the bank may consider adopting a long-run default-weighted LGD higher than the average for a certain facility.

6.4.12 Where the estimated LGD involves the mapping between certain facility data in the bank’s asset portfolio and the sample data of an external rating agency, a commercial bank shall compare the sample data and asset portfolio. The mapping policy of a commercial bank shall describe the range and method of sample data to avoid inconsistency of mapping methods or data errors.

6.4.13 A commercial bank shall formulate clearly-defined management policies for aggregating the LGD estimates of facility grades from a single risk exposure.

6.4.14 For retail exposures, long-run average estimates of PD and default-weighted average loss rates given default may be based on an estimate of the expected long-run loss rate. A commercial bank may use an appropriate PD estimate to infer the long-run default-weighted loss rate given default, or use a long-run default-weighted average loss rate given default to infer the appropriate PD. In either case, a commercial bank shall make sure that the LGD used for the IRB capital calculation is no less than the long-run default-weighted average loss rate given default.

6.4.15 When estimating the loss rate given default of a certain exposure on its own, a commercial bank shall estimate the LGD of all exposures of the same category. If the estimated LGD based on sample data is lower than 0, the bank shall check loss confirmation procedures and ensure that all economic losses are covered. Samples with LGD lower than 0 shall be deemed as 0.
6.5 EAD Estimation and Requirements

6.5.1 The term “exposure at default” (hereinafter referred to as “the EAD”) refers to the expected gross exposure on- and off-balance-sheet of the facility upon default of an obligor. EAD shall include the used credit balance, accrued interest receivable, expected withdrawn amount out of the unused credit line and possible relevant expenses.

6.5.2 The data used to estimate EAD shall only include the exposures of defaulted borrowers. These data shall include factors to differentiate exposures of defaulted borrowers.

6.5.3 If a commercial bank chooses to adopt the Advanced IRB approach, it shall assign an estimate of EAD for each on- and off-balance sheet facility. It shall be an estimate of the long-run default-weighted average EAD for similar facilities and borrowers over a sufficiently long period of time, but with a margin of conservatism appropriate to the likely range of errors in the estimate. As the methods for estimating EAD for different off-balance sheet items are different, the bank shall clearly describe the categories of off-balance sheet items.

6.5.4 If a commercial bank chooses to adopt the Foundation IRB approach, it shall recognize the effects of on-balance sheet netting, which shall meet the recognition standards in the Rules.

6.5.5 A commercial bank shall incorporate a larger margin of conservatism in the EAD estimate if a positive correlation is expected between the default frequency and the magnitude of EAD. For exposures for which EAD estimates are volatile over the economic cycle, the bank shall use the EAD estimates that are appropriate for an economic downturn, if these are more conservative than the long-run average.
6.5.6 If a commercial bank has developed its own EAD models, the estimation should consider the cyclical nature, if any, of the drivers of such models. The bank shall prudently use external data if it lacks sufficient data to examine the impact of previous recession(s).

6.5.7 Criteria by which a commercial bank derives estimates of EAD shall be plausible. Selection of standards shall be supported by credible internal analysis by the bank. The bank shall break down the drivers of EAD and use all relevant and material information in its derivation of EAD estimates. The bank shall also review its estimates of EAD for on- and off-balance sheet items at least when material new information comes to light and at least once a year.

6.5.8 The EAD estimates shall reflect the possibility of additional drawings by the borrower up to and after the time a default event is triggered. The bank shall have in place the relevant policies and control measures for additional drawings by the defaulted borrower or technically defaulted borrowers, and shall establish effective monitoring procedures to monitor the committed lines, outstanding balances and changes in outstanding balances of each borrower and grade both on and off-balance sheet.

6.5.9 With respect to retail exposures of future withdrawal, a commercial bank shall, before comprehensively verifying the loss estimates, take into account the historical withdrawals and expected withdrawals. Possibility of future withdrawal may be considered in the estimation of EAD or the estimation of LGD.

6.5.10 In case the withdrawn amount exposed to retail risks has been securitized, a commercial bank shall estimate EAD of un-withdrawn credit limit with credit conversion factors.

6.6 Maturity Estimation and Requirements

6.6.1 If a commercial bank chooses to adopt the Foundation IRB approach, the effective maturity of non-retail exposures is 2.5 years
except for repo-style transactions where effective maturity is 6 months.

6.6.2 If a commercial bank chooses to adopt the Advanced IRB approach, the bank shall treat the effective maturity as an independent risk factor. If other conditions are the same, the shorter the effective maturity of the facility is, the lower the credit risk will be.

6.6.3 Except for the following circumstances, effective maturity of a facility is the greater of one year and the internal estimates according to definitions provided below. In any cases, the effective maturity shall be no greater than 5 years. The effective maturity for the SME exposures may be 2.5 years.

6.6.3.1 For instruments subject to determined cash flow schedule, the effective maturity is defined as follows:

\[ M = \frac{\sum t \times CF_t}{\sum CF_t} \]

Where \( CF_t \) denotes the cash flows (principal, interest payments and fees) contractually payable by the borrower in period \( t \).

6.6.3.2 If the bank is not in a position to calculate the effective maturity of contracted payments as noted above, the bank shall use a more conservative measure of \( M \) such as that it equals the maximum remaining time (in years) that the borrower is permitted to take to fully discharge its contracted obligation (principal, interest payments and fees) under the terms of loan agreement.

6.6.3.3 For derivatives subject to a master netting agreement, the weighted average maturity of the transactions should be used when applying the explicit maturity adjustment, an the notional amount of each transaction shall be used for weighting the maturity.

6.6.4 For certain short-term transactions, the effective maturity shall be the greater of one day and the internal estimates, including:
6.6.4.1 Fully collateralized over-the-counter derivatives transactions, margin lending, repo-style transactions, and securities lending with an original maturity of less than 1 year. For all eligible transactions, the documentation must require daily revaluation and margin adjustment, and include provisions that allow for the prompt liquidation and setoff of the collateral in the event of default or failure to re-margin;

6.6.4.2 Short-term self-liquidating trade finance with an original maturity of less than 1 year, including issued and confirmed L/C; and

6.6.4.3 Short-term exposures with an original maturity of less than 3 months, including, but not limited to the OTC derivatives, margin lending, repo-style transactions and securities lending which are not comply with this subsection 6.6.4.1; exposures arising from settling securities purchases and sales; exposures arising from cash settlements by wire transfer; exposures arising from foreign exchange settlements; some short-term loans and deposits.

6.7 Stress Testing

6.7.1 A commercial bank shall perform stress tests on a regular basis. Through proper design of stress scenarios, the bank shall employ stress testing to assess the effect of certain specific conditions on risk parameters and capital adequacy of the bank, so as to ensure that the bank has sufficient capital to withstand the risks at any stage of the economic cycle.

6.7.2 The scope of stress testing of a commercial bank shall contain the major credit retail and non-retail exposures.

6.7.3 A commercial bank shall establish sound stress testing processes. Stress testing shall involve identifying possible events or for future changes in economic conditions that could have unfavorable effects on the bank’s credit exposures and assessment of
the bank’s ability to withstand such changes. The bank may develop its own techniques and approaches to undertaking stress tests in accordance with its own circumstances.

6.7.4 A commercial bank shall, based on its own circumstances and historical experience, design stress testing framework including the time span and stress scenarios. The bank’s selection of time span for stress scenarios shall be based on both real situation and theoretical assumptions. Scenario assumptions shall cover the risk factors under specific assumed stress scenarios, so as to reflect risks resulting from the recent market changes.

6.7.5 The main factors for a commercial bank to consider in performing stress tests include counterparty risk characterized by the increase of PD and worsening of credit spread. The bank shall consider all the material factors influencing the borrower's ability to repay, such as economic or industrial downturns, significant market impact and liquidity crunch.

6.7.6 Stress testing shall at least include scenario analysis of mild recessions, and shall be meaningful and conservative. In addition to the stress scenarios defined in the Rules, a commercial bank is free to choose the stress scenarios to assess the impact of certain special conditions on the credit risk capital requirements.

6.7.7 A commercial bank shall calculate the key risk parameters such as PD, LGD and EAD under the stress scenarios, and calculate data like risk-weighted assets, capital requirement and capital adequacy ratio based on these parameters.

6.7.8 A commercial bank may, according to internal management needs or regulatory requirements, carry out structural stress tests combining macro market factors, aim at the specific asset portfolio, such as real estate loans. Stress scenarios, risk factors, assumptions for structural stress tests may be different with the overall stress testing framework, but shall be justified by the bank.
6.7.9 A commercial bank shall use static or dynamic testing methods to measure the impact under stress scenarios. Regardless of the method adopted, the bank shall consider the following information sources:

6.7.9.1 The bank’s internal data shall allow estimation of the migration of borrower and facility ratings; and

6.7.9.2 The bank should evaluate evidence of ratings migration in external ratings, including mapping between internal and external ratings.

7.IT System and Data Management

7.1 IT system

7.1.1 A commercial bank shall establish a corresponding IT system to record workflows, collect and store data, so as to support operation of the internal rating system and risk parameter quantification. The bank shall ensure the reliability, safety and stability of the system operation.

7.1.2 The governance, development, security, operation and business continuity of the IT system established by a commercial bank for the internal rating system shall comply with the relevant provisions of Guidance on Information System Risk Management of Banking Institutions.

7.2 Data management

7.2.1 Data used by a commercial bank for internal rating shall meet requirements of accuracy, integrity and appropriateness.

7.2.2 A commercial bank shall set up a data warehouse to access, cleanse, convert and store internal and external data required by
internal rating. For the internal rating system, the data warehouse is a major data source and a system used to store returned outputs.

7.2.3 A commercial bank shall, on the basis of the data warehouse, set up a risk data mart, based on which, models are developed, optimized, calibrated and verified in the internal rating system. The risk data mart is a data set defined and designed to provide information required by internal rating, and it shall include detailed data about a single client or facility, asset portfolios related to industries, geographic locations and products as well as macro-level data.

7.2.4 A commercial bank shall ensure continuous availability of the data and provide continuous maintenance to ensure that the data used for validation and outputs of the rating system are replicated and that the data used for repeated calculation are documented and maintained.

7.2.5 A commercial bank shall prepare enough resources for the expansion of data warehouse, data mart and database system so as to provide information required by the internal rating system, and to ensure that no information is lost in the process of database expansion.

7.2.6 A commercial bank shall establish a data management system to collect and store key historical data so as to support the operation of the internal rating system. The data management system shall at least perform the following functions:

7.2.6.1 To track, record, maintain and analyze key data about borrowers and facilities within the entire lifecycle of non-retail exposures, including the historical rating information;

7.2.6.2 To have access to all rating data concerning non-retail exposures, including important qualitative and quantitative factors of borrower rating and facility rating;
7.2.6.3 To have access to the characteristics and historical performance of retail exposures and related borrowers at any specific period of time;

7.2.6.4 To have access to all the retail loan data to develop an asset pool assignment system;

7.2.6.5 To develop and improve the internal rating system, risk parameter measurement models and related procedures;

7.2.6.6 To measure regulatory capital requirement; and

7.2.6.7 To prepare internal and public reports.

7.2.7 A commercial bank shall set up policies and procedures for the internal rating system to control data quality, report data quality problems, amend inaccurate data and classify various data quality problems when reporting. The processed original data shall go through logic examination at a single time point, while the continuity and consistency between multiple time points shall satisfy statistical, business and logic examinations.

7.2.8 A commercial bank shall record completely the transfer, storage and update of data input in the database and shall create detailed documentation.

8.Use of Internal Ratings

8.1 Basic Requirements

8.1.1 A commercial bank shall ensure the outputs of its internal rating system and risk quantification are applied in the bank’s credit risk management practices. The bank’s internal ratings and estimates of risk parameters shall play an essential role in the credit approval, risk management, internal capital allocations, and corporate governance functions.
8.1.2 A commercial bank shall prove to the CBRC that the information used and generated by the internal rating system and applied to measure regulatory capital requirements is consistent with that used in credit risk management, including using the same sources of information, the same risk factors, the consistent rating structure and risk parameters.

If there are any differences, the bank shall document, disclose and explain to the CBRC both the reasons for and reasonableness of the differences, ensuring that the differences will not lead to lower capital requirements. This is one of the preconditions for obtaining the approval by the CBRC to adopt the IRB approach.

8.1.3 A commercial bank shall make full use of the information used and generated by the internal rating system to promote the continuous improvement of the system.

8.1.4 A commercial bank’s internal rating and risk quantification shall be regarded as an integral part of risk management culture, and shall be consistently implemented by the bank’s management and working level staff.

8.1.5 Before a commercial bank is approved to adopt the IRB approach, its internal rating system shall be in operation not less than three years, during which period the bank is allowed to improve the system.

8.1.6 Where a commercial bank adopts a number of approaches to internal rating and risk quantification, these approaches shall all meet the application requirements as stipulated in the Rules.

8.1.7 Senior management of a commercial bank and staff in relevant departments shall be required to understand the actual application of the internal rating system, rating models and rating outputs. In addition, senior management and relevant staff involved in the credit origination, approval and extension as well as risk management shall
have adequate understanding of the range and extent of internal rating application.

8.1.8 A commercial bank shall set up documentation for the application of the internal rating system. The documentation shall include, but not limited to, how the internal ratings and estimates of risk parameters are applied and the related supporting documents, records of differences between the internal rating system used to measure the regulatory capital requirements and internal risk management, application review and independent audit reports, etc.. The bank shall designate a department to track and record the actual application, and prepare for the supervision and inspection of CBRC.

8.1.9 The CBRC would not approve a commercial bank to adopt the IRB approach unless the bank’s internal rating system satisfies the application requirements as stipulated in the Rules. The system shall be deemed to fail to meet the requirements should it be under any of the circumstances as follows:

8.1.9.1 The internal rating system or risk quantification model is still at the stage of trial operation.

8.1.9.2 Internal ratings or estimates of risk parameters only serve as assistant or reference information for credit decision-making; or

8.1.9.3 Internal ratings and estimates of risk parameters are simply used to measure the regulatory capital requirements for credit risk.

8.1.10 A commercial bank that adopts the Foundation IRB approach shall demonstrate to the CBRC that the borrower’s ratings and PD estimates for non-retail exposures and the asset pool assignments and estimates of risk parameters for retail exposures shall be instrumental in the core scope of application and shall be reflected in the advanced scope of application.
8.1.11 A commercial bank that adopts the Advanced IRB approach shall demonstrate to the CBRC that the internal ratings and estimates of risk parameters have played an instrumental role in all aspects of core and advanced application scope.

8.2 Core Application Scope

8.2.1 Borrower or facility ratings shall be important grounds for credit approval, and a commercial bank’s credit policy shall clearly set forth that borrower or facility ratings are among the primary conditions for credit decision-making.

8.2.2 A commercial bank shall adjust the approaches and frequency of management oversight based on the ratings of borrowers or facilities.

8.2.3 A commercial bank shall set a single borrower or portfolio limit according to the borrower or facility ratings.

8.2.4 A commercial bank shall develop diversified credit policies according to the borrower and facility ratings as well as the ratings with respect to the industries and geographic locations.

8.2.5 The credit risk control department shall report to the board of directors, senior management and other related departments or persons the overview and changes of the borrower and facility ratings at least on a quarterly basis. The bank’s internal reporting system shall clearly specify the coverage, frequency and objectives of risk reporting.

8.3 Advanced Application Scope

8.3.1 Internal rating and estimates of risk parameters of a commercial bank shall be the key basis for the bank’s development of economic capital measurement models as well as a key source of input of parameters.
8.3.2 Internal ratings and estimates of risk parameters of a commercial bank shall serve as the foundation for the bank to determine risk appetites and plan risk strategies.

8.3.3 Estimates of risk parameters shall be an important basis for calculating a commercial bank's loan loss provisions.

8.3.4 Estimates of risk parameters shall serve as an important foundation for loans and investment pricing of a commercial bank.

8.3.5 Internal ratings and estimates of risk parameters shall be an important basis for calculating the risk-adjusted return on capital. A commercial bank shall include internal ratings in its performance assessment policies.

8.3.6 The development and application of the internal rating system and risk quantification models shall enable a commercial bank to develop the related information system, allocate adequate resources for risk management, and cultivate a prudent risk management culture within the bank.