IRB Approach

II. Orientation of the IRB Approach

11. One of the Committee's goals in setting forward an IRB approach is to align more accurately capital requirements with the intrinsic amount of credit risk to which a bank is exposed. The orientation of the IRB approach is consistent with the framework currently being used by many banks with well-developed risk management systems to assess internally both their credit risk profile and their capital adequacy.

12. Banks' internal measures of credit risk are based on assessments of the risk characteristics of both the borrower and the specific type of transaction. Most banks orient their borrower rating methodologies and risk management practices to the risk of borrower default. The probability of default (PD) of a borrower or group of borrowers is the central measurable concept on which the IRB approach is built. The PD of a borrower does not, however, provide the complete picture of the potential credit loss. Banks also seek to measure how much they will lose should a borrower default on an obligation. This is contingent upon two elements. First, the magnitude of likely loss on the exposure: this is termed the Loss Given Default (LGD), and is expressed as a percentage of the exposure. Secondly, the loss is contingent upon the amount to which the bank was exposed to the borrower at the time of default, commonly expressed as Exposure at Default (EAD). These three components (PD, LGD, EAD) combine to provide a measure of expected intrinsic, or economic, loss.

13. The IRB approach also takes into account the maturity (M) of exposures. Thus, the derivation of risk weights is dependent on estimates of the PD, LGD and, in some cases, M,

that are attached to an exposure. Where there is no explicit adjustment for maturity, a standard supervisory approach is presented for linking effective contractual maturity to capital requirements.

14. These components (PD, LGD, EAD, M) form the basic inputs to the IRB approach, and consequently the capital requirements derived from it. As such, most aspects of the IRB framework are designed to provide confidence that these elements are separately identifiable, measurable and capable of being verified by both banks and supervisors.

III. Simple Schematic of IRB Approach

17. This section provides an overview of how the supervisory IRB approach works in practice. There are five key elements.

- A classification of exposures by broad exposure type;
- For each exposure class, certain *risk components* which a bank must provide, using standardised parameters or its internal estimates;
- A *risk-weight function* which provides risk weights (and hence capital requirements) for given sets of these components;
- A set of *minimum requirements* that a bank must meet in order to be eligible for IRB treatment for that exposure, and
- Across all exposure classes, supervisory review of compliance with the minimum requirements.

A. Categorisation of exposures

19. Banks typically manage their credit-related business in broad business lines or portfolios, each of which may encompass a variety of specific borrower and exposure types. Although the specific business line and portfolio delineation used by individual banks can vary greatly, the key common bonds that define a business line or portfolio may be related to the nature of the customer (e.g. governmental, corporate, household), the nature of the transaction, or a combination of the two.

20. The design and features of internal rating systems and internal default-loss estimation processes, as key risk management tools, also reflect this broad management approach. At the same time, there can be significant differences across business lines or portfolios in the key risk factors and rating criteria, on the one hand, and the historical loss characteristics or relationships on the other. For example, while political factors are key criteria in the assessment of a sovereign, this is hardly the case when considering the ability of an individual to repay a credit card obligation. Similarly, the likely pattern of portfolio losses for a retail portfolio – typically made up of many unrelated borrowers – is very different from that of a portfolio of a much smaller number of corporate exposures, because defaults by individuals tend to be driven more heavily by factors idiosyncratic to the borrower. These differences translate into key differences in the distribution of credit loss events for the different portfolios, and thus different relationships between risk characteristics and unexpected loss or required capital. Banks' internal assessments of economic capital reflect these differences, and to be appropriately risk sensitive, the IRB approach also needs to consider them in the construction of capital treatments.

21. The above motivates the requirement that under the IRB approach, banks must assign banking-book exposures into one of six broad classes of exposures with different underlying credit risk characteristics: corporates, sovereigns, banks, retail, project finance, and equity. Definitions for each exposure class are contained within the relevant section of this Supporting Document. As noted in these sections, the Committee is continuing to work on refining the boundaries between these different classes and, in some cases, on the definition of the exposure classes themselves. Generally, all exposures that do not specifically meet one of the definitions for exposure classes set out in this document (e.g. corporate, retail, sovereign) will be categorised as corporate exposures for purposes of the IRB approach. The objective of this proposal is to avoid the potential for regulatory capital arbitrage which may occur through an artificial characterisation of an exposure by a bank for the purpose of reducing regulatory capital requirements.

22. The classification of exposures in this way is broadly consistent with established bank practice. However, some banks may use different definitions in their internal risk management and measurement systems. While it is not the intention of the Committee to require banks to change the way in which they manage their business and risk, banks will be required to apply the appropriate treatment to each exposure for the purposes of IRB analysis, tabulation, and reporting.

B. Risk components

23. The capital charge for exposures within each of the six exposure classes discussed above will then depend on a specific set of risk components, or inputs. In the IRB framework for corporate, sovereign, and bank exposures classes, these inputs are provided either through the application of standardised supervisory rules (foundation methodology) or internal assessments (advanced methodology), subject to supervisory minimum requirements. For purposes of simplicity, the exposition below focuses on the inputs required

for the IRB approach to corporate, sovereign, and bank exposures, though its orientation is applicable to other exposure types with some modification.

(i) Probability of Default

24. All banks, whether using the foundation or advanced methodologies, must provide supervisors with an internal estimate of the PD associated with borrowers in each borrower grade. Each estimate of PD must represent a conservative view of a long-run average PD for the grade in question, and thus must be grounded in historical experience and empirical evidence. Preparation of the estimates, and the risk management processes and rating assignments that lay behind them, must reflect full compliance with supervisory minimum requirements (including internal use and disclosure requirements associated with the estimates) to qualify for IRB recognition.

(ii) Loss Given Default

25. While the PD associated with a given borrower does not depend on the features of the specific transaction, LGD is facility-specific because such losses are generally understood to be influenced by key transaction characteristics such as the presence of collateral and the degree of subordination.

26. LGD is determined in one of two ways. Under the foundation methodology, LGD is estimated through the application of standard supervisory rules, which differentiate the level of LGD based upon the characteristics of the underlying transaction, including the presence and type of collateral. The supervisory rules and treatments were chosen to be conservative. The starting point proposed by the Committee is use of a 50% LGD value for most unsecured transactions, with a higher LGD (75%) applied to subordinated exposures. For transactions with qualifying financial collateral, the LGD is scaled to the degree to which the transaction is secured, using a haircut methodology adapted from that described for the standardised approach. For transactions with qualifying commercial or residential real estate collateral, a separate set of supervisory LGD values and recognition rules are applied. All other transactions are viewed as unsecured for this regulatory purpose.

27. In the advanced methodology, the bank itself determines the appropriate LGD to be applied to each exposure, on the basis of robust data and analysis which is capable of being validated both internally and by supervisors. Thus, a bank using internal LGD estimates for capital purposes might be able to differentiate LGD values on the basis of a wider set of transaction characteristics (e.g. product type, wider range of collateral types) as well as borrower characteristics. As with PD estimates, these values would be expected to represent a conservative view of long-run averages, although banks would be free to use more conservative estimates. A bank wishing to use its own estimates of LGD will need to demonstrate to its supervisor that it can meet additional minimum requirements pertinent to the integrity and reliability of these estimates.

(iii) Exposure at Default (EAD)

28. As with LGD, EAD is also facility specific. In most cases EAD will equal the nominal amount of the facility, but for certain facilities (e.g. those with undrawn commitments) it will include an estimate of future lending prior to default. Again as with LGD, under the foundation methodology EAD is estimated through the use of standard supervisory rules.

29. In the advanced methodology, the bank itself determines the appropriate EAD to be applied to each exposure, on the basis of robust data and analysis which is capable of being validated both internally and by supervisors. Thus a bank using internal EAD estimates for capital purposes might be able to differentiate EAD values on the basis of a wider set of transaction characteristics (e.g. product type) as well as borrower characteristics. As with PD and LGD estimates, these values would be expected to represent a conservative view of long-run averages, although banks would be free to use more conservative estimates. A bank wishing to use its own estimates of EAD will need to demonstrate to its supervisor that it can meet additional minimum requirements pertinent to the integrity and reliability of these estimates.

(iv) Maturity

30. Where maturity is treated as an explicit risk component, banks will be expected to provide supervisors with the effective contractual maturity of their exposures.

C. Risk weights

31. The estimates of PD, LGD and in some cases maturity (M) associated with an exposure combine to map into a schedule of regulatory capital risk weights. In the standardised approach, borrowers are assigned to one of five risk weights (0%, 20%, 50%, 100%, 150%) on the basis of supervisory standard treatments or assessments provided by external credit assessment institutions. The IRB approach provides for a finer differentiation of risk, in that estimates of PD, LGD and M are developed separately and then used as inputs to produce corresponding risk weights. Given this additional sensitivity, the risk weights reflect the full spectrum of credit quality through use of a continuous function of risk weights in the place of the five discrete risk buckets of the standardised approach. Thus, under the IRB framework, different sets of risk inputs will generally produce a different risk weight. In this way, exposures to borrowers where PD, LGD and in some cases M combine to produce a very low level of risk will tend to have risk weights which are below their equivalents in the standardised approach. By the same token, exposures to counterparties where PD, LGD and maturity combine to produce a significant degree of risk will tend to attract risk weights which are higher than those contemplated in the standardised approach.

32. To calculate risk-weighted assets, the bank will multiply the risk weights by a measure of exposure, here the estimate of EAD, and add the resulting amounts across the portfolio. Finally, an adjustment factor, in the form of a standard supervisory index, is then applied to the total risk weighted assets to reflect the granularity of the bank's non-retail portfolio (see Chapter 8).

Standardized approach

https://rbidocs.rbi.org.in/rdocs/notification/PDFs/58BS09C403D06BC14726AB61783180628D39.PDF

Section 5.1 to 5.15.2 – Page 35 to 52

Content credits:

https://www.bis.org/publ/bcbsca05.pdf