THE MANAGEMENT OF CREDIT RISK ACCORDING

TO INTERNAL RATINGS- BASED APPROACH

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*The internal ratings based approach (**IRB Approach**) was created as part of **Basel II** replacing the original Basle Accord of 1988 (**Basle I**) in an effort to create a better framework for regulating bank capital. This paper covers the methodology and components of the IRB Approach used to determine capital requirements for credit risk. Such an approach, which relies heavily upon a bank's internal assessment of its counterparties and exposures, can secure two key objectives consistent with those which support the wider review of The New Basel Capital Accord.. IRB approach should promote safety and soundness in the financial system and, consistent with providing incentive compatibility, that the structure and requirements of the IRB approach do not impinge upon or undermine banks' well-established lending and credit risk management practices*

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The main objective of the Basel-II is to strengthen the stability of the international banking system concerning better risk management, by bringing regulatory capital requirements more in line with bank good practices. This implies credit capital requirements to be significantly more risk sensitive and it is possible to achieve by introducing an operational risk capital charge.
The importance of risk management derives from the objectives of financial regulation. The problem of systemic risk constitutes part of the embodiment of the rationale for financial regulation.[423] Regulators impose liquidity monitoring measures on banks to meet specified minimum levels of withdrawals. However, such measures are precautionary against short-term cash flow problems rather than a situation of panic outburst.[424] The level of confidence reposed in the public by the financial community is what sustains banks in modern times and this is strengthened by external checks which is given by credit agencies through scrutiny of published accounts and by bank regulation through prudential supervision.[425] Prudential regulation however, is not the only way in which some regulators take interest in the financial management of authorised firms – there is also the principle of ensuring that a firm operates with required minimum level of capital in order to reduce the consequences of failure. As a result, the focus on

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[423] Ojo, Marianne (2008), Risk Management by the Basel Committee: Evaluating Progress made from the 1988 Basel Accord to Recent Developments; Center for European Law and Politics, University of Bremen.

[424] S Gleeson (2006), *Prudential Regulation of Banks under the FSMA,* J Tattersall (ed) second edition

[425] Ibidem;

the solvency and safety and soundness of financial institutions and minimum capital requirement are often regarded as synonymous.[426]

The new Accord is organized around three so-called pillars. First, it represents a comprehensive set of rules designed to measure the risks in banks' portfolios and to produce minimum capital requirements. Second, it refers to a supervisory review process setting out the role of bank supervisors in ensuring that the new framework is correctly executed. The purpose of the third pillar is to increase the transparency of bank's risk profiles for market participants through disclosure requirements, i.e. to promote market disciplinary effects towards sound banking practice.

The guiding principle of the new accord is that the size of the buffer capital is made much more risk sensitive compared with the current accord. The first pillar proposes two main routes for banks to follow when determining risk weights. First, a base-line "standardized approach" designed to be applicable for every bank. In this approach a portfolio of bank loans will be characterized by a relatively small number of risk categories, and the risk weight associated with a given category is based on an external rating institution's evaluation of counterparty risk. Second, a more elaborate model: the so-called Internal Ratings Based (IRB) approach. The underlying idea is to make further use of the information collected and processed in the bank's internal counterparty rating operation. Since banks make it a business to evaluate risks, these evaluations ought to be a reasonable basis for risk-contingent capital adequacy determination. Each internal rating category in a loan portfolio is characterized by an estimate of its average probability of default, calculated by the bank itself. By means of an estimated function, the supervisory authority provides a mapping from the estimated probability of default to a relative risk weight. The products of relative risk weight, exposure at the time of default (usually taken as the face value of the loan), and the 8 percent absolute capital requirement, summed over the loans of the portfolio give the bank's required buffer capital. The current accord suggests that the banks may choose to apply the IRB-approach at either of two levels of sophistication. The more advanced requires bank internally generated inputs on loss given default and exposure at default, whereas the simpler only requires the bank to provide estimates of probability of default.

Minimum capital requirements for credit risk

Capital adequacy constitutes one of the foundations of prudential supervision. In the New Basel Capital Accord the Basel Committee proposed a capital adequacy framework based on three complementary pillars: minimum capital requirements, a supervisory review process and market discipline. Capital adequacy is a term used to describe the adequacy of a bank's aggregate capital in relation to the risks which arise from its assets, its off balance sheet transactions, its dealing operations and all other risks associated with its business.[427] The aim is for a bank to have enough capital in relation to its risks to absorb the highest foreseeable amount of loss and still give allowance in which to realise assets, raise new capital or arrange for disposition of its business.

There are always some borrowers that fail to meet their obligations. The losses caused by default events fluctuate every year, depending on the number and severity of default events. Financial institutions forecast the expected loss by estimating the proportion of obligors that might default within a given time horizon, multiplied by the outstanding exposure at default and once more multiplied by the percentage of exposure that will not be recovered by sale of collateral.[428]

Simple Schematic of IRB Approach

We can consider five key elements:

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[426] Ibidem;

[427] J Hitchins, M Hogg and D Mallet, (2001) *Banking : A Regulatory Accounting and Auditing Guide* (Institute of Chartered Accountants;

[428] Joocheol Kim, KiHyung Kim, (2006), Loss Given Default Modelling under the Asymptotic Single Risk Factor Assumption, Yonsei University, Seoul, Korea

[1]A *classification of exposures* by broad exposure type; [2]For each exposure class, certain *risk components* which a bank must provide, using standardised parameters or its internal estimates; [3]A *risk-weight function* which provides risk weights (and hence capital requirements) for given sets of these components; [4]A set of *minimum requirements* that a bank must meet in order to be eligible for IRB treatment for that exposure, and [5]Across all exposure classes, supervisory review of compliance with the minimum requirements.

A classification of exposures by broad exposure type

Under the IRB approach, banks must categorize banking-book exposures into broad classes of assets with different underlying risk characteristics, subject to the definitions set out below.

The classes of assets are: (1) corporate, (2) sovereign, (3) bank, (4) retail, (5) equity.

IRB banks are required to assign each of their banking-book exposures to one of those classes. If an exposure does not fall within the definition of any class, it will be categorized as a corporate exposure for the purposes of the IRB approach. Banks are required to apply the appropriate treatment to each exposure for the purposes of deriving their minimum capital requirement.

(1) *Definition of corporate exposures.* In general, a corporate exposure is defined as a debt obligation of a corporation, partnership, or proprietorship. Banks are permitted to distinguish separately exposures to small- and medium-sized entities (SME).

(2) *Definition of sovereign exposures.* It *c*overs all exposures to counterparties treated as sovereigns under the standardised approach. This includes sovereigns (and their central banks), certain public sector entities (PSEs) identified as sovereigns in the standardised approach, multilateral development banks (MDBs) that meet the criteria for a 0% risk weight under the standardised approach, and the entities claims on the Bank for International Settlements, the International Monetary Fund, the European Central Bank and the European Community.

(3) *Definition of bank exposures.* This asset class covers exposures to banks and some securities firms. Otherwise such claims would follow the rules for claims on corporates. Bank exposures also include claims on domestic PSEs that are treated like claims on banks under the standardised approach, and MDBs that do not meet the criteria for a 0% risk weight under the standardised approach.

(4) *Definition of retail exposures.* An exposure is categorized as a retail exposure if it meets all of the following criteria:

Nature of borrower or low value of individual exposures:

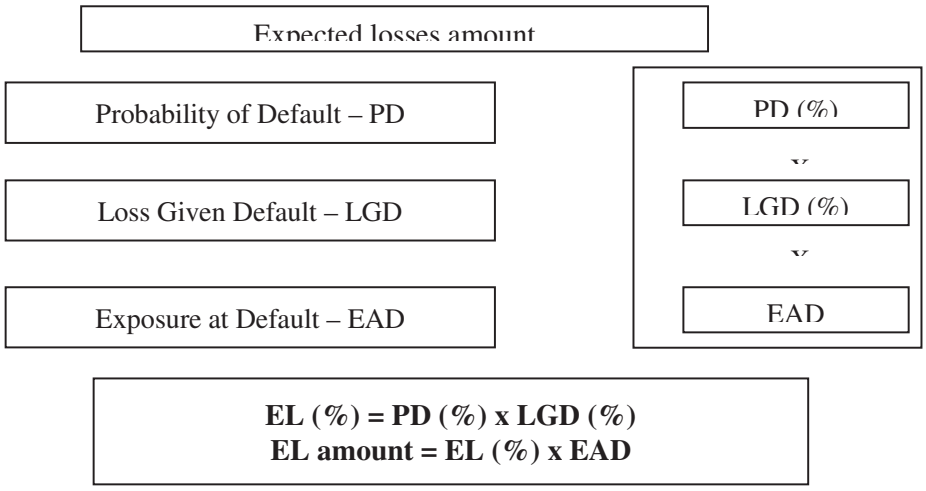
- Exposures to individuals: are generally eligible for retail treatment regardless of exposure size, although supervisors may wish to establish exposure thresholds to distinguish between retail and corporate exposures.
- Residential mortgage loans: are eligible for retail treatment regardless of exposure size so long as the credit is extended to an individual that is an owneroccupier of the property (with the understanding that supervisors exercise reasonable flexibility regarding buildings containing only a few rental units ─ otherwise they are treated as corporate).
- Loans extended to small businesses and managed as retail exposures are eligible for retail treatment provided the total exposure of the banking group to a small business borrower (on a consolidated basis where applicable) is less than €1 million. Small business loans extended through or guaranteed by an individual are subject to the same exposure threshold.
- It is expected that supervisors provide flexibility in the practical application of such thresholds such that banks are not forced to develop extensive new information systems simply for the purpose of ensuring perfect compliance. It is, however, important for supervisors to ensure that such flexibility (and the implied acceptance of exposure amounts in excess of the thresholds that are not treated as violations) is not being abused.

Large number of exposure:

The exposure must be one of a large pool of exposures, which are managed by the bank on a pooled basis. Supervisors may choose to set a minimum number of exposures within a pool for

exposures in that pool to be treated as retail. Small business exposures below €1 million may be treated as retail exposures if the bank treats such exposures in its internal risk management systems consistently over time and in the same manner as other retail exposures.
(5) Definition of equity exposures. In general, equity exposures are defined on the basis of the economic substance of the instrument. They include both direct and indirect ownership interests, whether voting or non-voting, in the assets and income of a commercial enterprise or of some financial institution that is not consolidated. An instrument is considered to be an equity exposure if it meets all of the following requirements: (a) It is irredeemable in the sense that the return of invested funds can be achieved only by the sale of the investment or sale of the rights to the investment or by the liquidation of the issuer; (b) It does not embody an obligation on the part of the issuer; and (c) It conveys a residual claim on the assets or income of the issuer.
Within the corporate and retail asset classes, a distinct treatment for *purchased receivables* is also applied with certain conditions. Eligible purchased receivables are divided into retail and corporate receivables. Banks also must determine regulatory capital requirements on exposures arising from traditional and synthetic *securitisations* or similar structures that contain features common to both. For each of the asset classes covered under the IRB framework, there are three key elements: (a)Risk components-estimates of risk parameters provided by banks some of which are supervisory estimates; (b)Risk-weight functions-the means by which risk components are transformed into risk-weighted assets and therefore capital requirements; (c)Minimum requirements-the minimum standards that must be met in order for a bank to use the IRB approach for a given asset class.
Banks that have received supervisory approval to use the IRB approach may rely on their own internal estimates of risk components in determining the capital requirement for a given exposure. The risk components include measures of the: (a)*Probability of default (PD)*: Estimate of the likelihood of the borrower defaulting on his obligations within one year; (b)*Loss given default (LGD)*: Loss on the exposure following the borrower's default, commonly expressed as a percentage of the debt's original nominal value; (c)*Exposure at default (EAD)*: Nominal value of the borrower's outstanding debt; (d)*Effective maturity of the loan (M)*.
The use of the IRB approach is subject to an explicit supervisory approval, which depends on meeting certain minimum requirements from the outset and on an ongoing basis. The IRB approach is based on measures of unexpected losses (UL) and expected losses (EL).
The internal-ratings system is based on Foundation IRB and Advanced IRB, accompanied by a set of formula provided by the Basel II Accord.
- **The Foundation IRB (F-IRB)**. Under this approach banks are allowed to develop their own empirical model to estimate the PD for individual clients or groups of clients and they are using regulator's prescribed LGD and other parameters required for calculating the RWA (Risk-weighted asset).[429]
- **The Advanced IRB (A-IRB)**. Under this approach banks are allowed to develop their own empirical model to estimate PD, EAD, LGD and other parameters required for calculating the RWA. No matter the approach, the total required capital is calculated as a fixed percentage of the estimated RWA.[430]
Expected losses are determined as follows:

[429] Miru Oana Maria, Hetes-Gavra Roxana, Nicolescu Ana Cristina (2008), Applying Basel II Requirements in Romania West University from Timisoara (Romania), Faculty of Economics and Business Administration, Finance Department
[430] Ibidem



***Source*:** Georgescu F. (2005) – BASEL II - A New Stage in Modernising the Romanian Banking System - Florin Georgescu, NBR First Deputy Governor Presentation delivered on the occasion of EU-COFILE (European Union Finance & Banking Lectures project)

The risk components serve as inputs to the risk-weight functions that are developed for each asset class. For example, there is a risk-weight function for corporate exposures and another one for retail exposures. For each asset class we have relevant risk-weight function(s), risk components and other relevant factors, such as the treatment of credit risk mitigants.

The general formula for calculating risk-weighted assets is:

$$RWA = RW\ (\%)\ x\ EAD$$

RWA – risk-weighted assets, RW – risk weight, EAD – value of exposure

Risk-weighted exposers are determined in different specific way depending on the classes of exposures, but it has to take in consideration PD, LGD, M and EAD risk parameters.

Certain minimum requirements which relate to internal ratings, credit assessments and disclosure need to be fulfilled in order for a bank to qualify for an application of the IRB approach.[431] Furthermore, the eligibility requirements for an internal ratings based model imposes obligations on the bank to set up an internal ratings model for purposes of compartmentalising the exposure of various lending activities, be they commercial or consumer lending, and depending on whether such are on or off balance sheet activities. Qualifications aimed at satisfying the demands of the Advanced IRB approach would require the fulfillment of supplementary conditions which would apply in exposure calculations where the following events occur, namely: default, loss in the event of default and maturity of the exposure.

The minimum requirements are set out in 12 separate sections concerning: (a)composition of minimum requirements, (b)compliance with minimum requirements, (c)rating system design, (d) risk rating system operations, (e)corporate governance and oversight, (f)use of internal ratings, (g) risk quantification, (h)validation of internal estimates, (i)supervisory LGD and EAD

[431] Ojo, Marianne (2009), The responsive approach by the Basel Committee (on Banking Supervision) to regulation: Meta risk regulation, the Internal Ratings Based Approaches and the Advanced Measurement Approaches. Center for European Law and Politics, University of Bremen.

estimates, (j)requirements for recognition of leasing, (k)calculation of capital charges for equity exposures, and (l)disclosure requirements.

Romania, due to its accession to the EU in 2007 and, because of the large number of banks part of an international group, alongside with the diversification of the banking operations, it had to adhere to the international regulations and transpose the Basel II requirements into national legislation. In Romania, the implementation of the new capital accord, poses a series of challenges both on the credit institutions and on the National Bank of Romania (NBR).

In Romania, the regulatory framework has been substantially reconfigured. The banking laws were revised, in order to meet the Basel II criteria. The National Bank of Romania has done some work in this respect. For the banking sector and the capital market the year 2006, was dominated by the transposure of the European legislation that ensure the implementation of the Basel II standards into the national legislation. The process of transposing the EC 2006/49 Directive, with respect to the adequacy of the investment firms and credit institutions' capital level, was of great significance. This exercise has joined the forces of the national competent authorities in the financial sector, such as the National Bank of Romania and the National Securities Commission, the Ministry of Finance and the banking community and was finalized through the publication of the Government Emergency Ordinance (GEO) 99/2006 concerning credit institutions and capital adequacy. This regulation, accomplished through the application of the EC directive, for both credit institutions and financial investment institutions, has the advantage that it integrates the legal dispositions regarding all kinds of credit institutions, i.e. banks, mortgage banks, savings banks, which before were regulated separately.

The new capital adequacy framework became effective beginning with 1st of January 2007. The new legal context, together with the Romania's EU membership, favours the presence of some EU implementation particularities, of the capital standards applicable to credit institutions and investment firms.

The regulatory framework for managing credit risk according to the internal-based approach in Romania is transposed into two regulations:

-Regulation No. 15/20/2006 issued by the National Bank of Romania and the National Securities Commission on credit risk management by credit institutions and investment firms according to the internal ratings-based approach (Monitorul Oficial al României No. 1033/27 Dec.2006).

-Regulation No. 26 of 15 December 2009 approves the implementation, validation and assessment of approaches based on internal rating models for credit institutions (Monitorul Oficial al României No. 912/24 December 2009).

Conclusions

The implementation of the Basel requirements is a challenge for both the commercial banks and the National Bank. Legislative modifications have been made for the specific legal and institutional setting, as well as for some features of the Romanian financial system.

The Internal Ratings Based approach for the determination of required buffer capital is one of the greatest achievements of the Basel II Accord.

The implementation of IRB is a complex activity, that needs qualified personnel both in commercial banks and national banks. In Romania only 1(one) commercial bank is managing credit risk according to the internal-based approach, the foundation approach.

The costs of implementation is higher for IRB than for the Standard Approach, which means that it could be quite difficult for the small and medium-sized banks to undertake this approach. But even for the large banks, with international activities, and part of an international group, this can be a little difficult, as they cannot just take the framework from the mother bank, which has already developed it. This is because of the specificities of each national financial system.

Another problem is concerning databases. Banks need to implement substantial changes to their internal systems to prepare for appropriate data collection and revised reporting requirements.

These changes may require systems integration, modification and new software. This also affects banks in matter of costs.
In establishing an Internal Ratings Based approach, the Basel Committee's intention was directed at fine tuning capital requirements with a greater degree of accuracy to the level of a bank's exposure to credit risk. The IRB approach should operate consistently with the system adopted by banks whose risk management systems are capable of making internal assessments in matters related to their capital adequacy and risk profiles.

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[4] Miru Oana Maria, Hetes-Gavra Roxana, Nicolescu Ana Cristina (2008), Applying Basel II Requirements in Romania West University from Timisoara (Romania), Faculty of Economics and Business Administration, Finance Department
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