# Characteristics of Managing Operational Banking Risk

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***Abstract.*** *The objective of this paper is to provide a global perspective of the operational risk from a banking societies' viewpoint. We describe the main regulations and settlements in the field and examine the various approaches of the operational banking risk. The paper presents the need of banks to managing operational risk. We study comparatively for a banking society the capital charge for covering the operational risk under the basic indicator approach and under the standardized approach. We present a case study of implementing current capital requirements at the level of a Romanian banking society. From the theoretical approach and from the description of quantifying of operational banking risk, the results of this study insist on the importance of measuring of operational banking risk and identifies major issues that need to be considered to improve the managing operational banking risk.*

**Key words:** operational; banking; risk; capital adequacy; challanges.

**JEL Codes:** G21, G32.
**REL Codes:** 11C.

## 1. Aim and research methodology

The aim of this study is to provide a comprehensive description of the framework and methodology for identifying, measuring and modelling operational banking risk. We concentrate our approach on the investigation of the regulatory implications of varying characteristics of operational risk and different methods to identify operational risk exposure. After the presentation of the general frame of reference of the theme in the specialty literature and in the specific national and international legislation, the study approaches the present stage of the operational banking risk management in Romania. First, we questioned the necessity of measuring the banking operational risk, trying to find out what extent banks need to know the quantitative aspects of this type of risk. The arguments for the necessity of measuring this risk were essential. There wasn't only about some regulatory restrictions, which impose the measurement of this risk for banks, but also about the objective and real necessity of the banks to know the losses they could register out of the events generating operational risk. Once established the necessity for measuring the banking operational risk, we approached the real methods that banks can use in measuring this type of risk. Due to the character of operational risk of being produced or not in a future period of time, measuring it means in fact an activity of forecasting the potential losses that the events generating operational risk can bring for a banking society.

The information on the study theme was realized by studying the national specialty literature and international one in the field, by analyzing the legislation and by consulting the available information's from the institutions level which make studies and researches on the operational banking risk such as the Bank of International Settlement and National Bank of Romania. The direct documentation tasked to assure the information and the knowledge of the practical phenomenon of operational risk management was realized at the banking societies from Romania through studying their internal regulations.

## 2. Theoretical background

The banking operational risk issue has been the object of several debates in the last years, the specialized literature offering multiple studies and analysis on this subject.

R. J. Herring (Herring, 2002) analyses the evolution of the operational risk studies and regulations. It is by no means clear that capital regulation is the most efficient means of achieving a reduction in the exposure of institutions to operational risk. Moreover, there is no systemic risk rationale for imposing capital requirements because losses due to operational risk tend to be idiosyncratic to a particular institution. The sorts of institution-destroying operational losses that have occurred – often due to the actions of a rogue trader – are usually attributable to a failure of internal controls rather than inadequate capital. No reasonable amount of capital would be sufficient to cover such an extreme event.

The most effective means of reducing operational risk are sound policies, practices and procedures, and insurance.

M. Power's opinion (Power, 2003, p. 2) about the management of the operational banking risk holds our attention, through an original approach regarding to the invention of the operational risk. He affirms that is not merely figurative or fanciful to suggest that operational risk has been "invented". He examines the rapid emergence of operational risk from Basel II epistemic status to its institutionalization as a key component of global banking regulation. The author remarks the three keys domains of operational risk policy controversy as being: definitional issues, data collection and the limits of quantification.

D. Rowe, D. Jovic and R. Reeves (Rowe et al., 2004, pp. 15-21) study the capital of the financial institutions and affirm that the capital is the key to any financial institution. Companies in other industries need capital to buy property and production equipment. For financial institutions, the primary function of capital is to cover unexpected risks losses, because risk of such losses inevitably accompanies a bank's core business of lending money and making markets. The authors explain why it is crucial for financial institutions to build an advanced economic capital framework and how that plays into current initiatives to implement the Basel II Capital Accord.

A. Sheen (Sheen, 2005, pp. 313-323) seeks to identify the general operational risk standards embodied in the Basel and EU documents and to distil these standards into ten qualitative operational risk elements that are likely to be considered as part of any assessment of a credit institution's and investment firm's operational risk framework.

F. Flores, E. Bonson-Ponte and E. Escobar-Rodriguez (Flores et al., 2006, pp. 383-401) analyse the capacity of response of the banking sector's information systems, in the light of the new requirements of Basel II on the measurement and control of operational risk. They developed a structured case with a Spanish savings bank of medium size; an analysis is made of the practices and structures that may need to be modified to prevent a loss of competitive position.

K. Dutta and J. Perry (Dutta, Perry, 2007) model the operational risk through the severity distribution using three different techniques: parametric distribution fitting, a method of Extreme Value Theory (EVT), and capital estimation based on non-parametric empirical sampling. They found that applying different models to the same institution yielded vastly different capital estimates. They also found that in many cases, applying the same model to different institutions, yielded very inconsistent and unreasonable estimates across institutions even when statistical goodness-of-fit was satisfied. This raises two primary questions regarding the models that only imply realistic estimates in a few situations: (1) Are these models even measuring risk properly for the cases when they do yield reasonable exposure estimates, or are some reasonable estimates

expected from any model simply due to chance? (2) If an institution measures its exposure with one of these models and finds its risk estimate to be reasonable today, how reasonable will this estimate be over time?

A. Fernandez-Laviada (2007, pp. 143-155) describes the new role of the internal audit function in reviewing the operational risk framework. An efficient operational risk management framework will improve and reinforce the internal controls of the organization. Internal audit should be alert to the whole process of implementation of the systems for managing operational risk in entities.

A.A. Jobst (2007, pp. 423-449) consider amid increased size and complexity of the banking industry that operational risk has a greater potential to occur in more harmful ways than many other sources of risk. He seeks to provide a succinct overview of the current regulatory framework of operational risk under the New Basel Accord with a view to inform a critical debate about the influence of data collection, loss reporting, and model specification on the consistency of risk-sensitive capital rules.

In the field of the approached theme, the specialty literature detains theoretical analysis and empirical studies of the operational banking risk and its quantification. In the last few years, the importance given to the studying of the operational banking risk was the biggest one. Proves of this importance are offered by the analyzed representative papers.

## 3. General banking operational risk management framework

### 3.1. Operational banking risk – a significant banking risk, according to the Basel II Agreement

The first tendency for the one who is preoccupied with measuring the operational risk within an entity is to declare that this type of risk is a non-measurable risk. Such an attitude is based on the risk's essence itself. Generally, the risk is associated with uncertainty. The risk is often identified with uncertainty, and uncertainty affects any field of activity. The banking field is more affected by uncertainty than other economic fields. Measuring the risk would mean measuring the uncertainty in this case. Recent approaches of banking risks are based on defining these risks as being rather effects of exposure in an uncertain situation. With such an acceptation of the banking risks, measuring them becomes possible using advanced statistics methods of valuation, which establish the probability of an unfavourable situation's appearance.

Contemporary banks don't aim at eliminating the risks (an impossible approach in the present banking field), but they concentrate on learning the potential danger and the level of impact for the risks affecting their activity. In this way they create the premises for an efficient management of the banking risks by the possibility of forecasting the risk event's happening in a certain measure and of taking in time decisions necessary for reducing the risk of eventual unfavourable consequences.

Between the significant banking risks, the operational risk detaches due to the complex character of the events generating banking operational risks and due to the difficulties of measurement. Generally, managing the banking risks means identifying, measuring, supervising and controlling. Speaking of the banking operational risk, these activities are difficult to implement and imply the banks' efforts in drawing up methods and mechanisms of reducing the negative effect of the events generating operational risk.

The banking operational risk is given a great importance also because it is considered a category of significant banking risk, according to the Basel II Agreement. The banking operational risk has been a preoccupation for the banking and academic fields before the Basel II Agreement, too. The banks have become aware of the operational risk's importance, but they have differently reacted according to their consent of investment in monitoring this risk. In the most times, banks considered the banking operational risk an unknown component of their costs. The reason is the insufficient preoccupation for managing this risk, but also the substantial costs for developing the databases with events generating operational risk.

We can say that adopting the Basel II Agreement brought a revolution in the operational risk field. This category of risk is taken into account for the first time in an international agreement for determining the banks' capital requirements.

The Basel II Capital Agreement, the name of the International Convergence of Capital Measurement and Capital Standards – a Revised Framework, has been finalized by the Basel Committee and has been signed in November 2005. The Basel II Agreement doesn't have an imperative character for any national state; it is just a guiding frame for adopting the specific national legislations. As for the countries part of the European Union, the Basel II settlements had been the base for configuring the European Directive adopted under the name of *Capital Requirements Directive* CRD or *Capital Adequacy Directive CAD* by the Council and European Parliament in June 2006. The directive represents in fact the combination of two directives: Directive 2006/48/EC regarding the building and activity of the credit institutions (revised) and the Directive 2006/49/EC regarding the capital adequacy of the investments societies and credit institutions (revised). European Union's member states had to transpose the settlements of the Directive CDR and the credit institutions had to apply them starting with the beginning of 2007. Romania's adhesion to the European Union from January the 1st 2007 implied the obligation to enforce the communitarian regulations in our banking system, too. But in 2007, credit institutions were able to choose between the settlements of the first Basel I Agreement and the first or average approaches of the new Basel II Agreement. The most sophisticated approaches of the new agreement (advanced approach IRB for the credit risk and AMA approach for the operational risk) are available since the year

2008, when all credit institutions from the European Union have to apply the Basel II Agreement.

The Basel II Agreement defines the operational risk in part V, point 644 like this: operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, people and systems or from external events. This definition includes legal risk, but excludes strategic and reputation risk. Legal risk includes, but is not limited to, exposure to fines, penalties, or punitive damages resulting from supervisory actions, as well as private settlements. Banks must allocate extra capital for this type of risk. The Agreement presents three methodologies of measurement of operational risk, being in fact methods for calculating operational risk capital charges in a continuum of increasing sophistication and risk sensitivity: the Basic Indicator Approach, the Standardized Approach and Advanced Measurement Approaches. We consider that the first two approaches are not properly named methodologies for measuring the banks' exposure at operational risk, they being rather „security screens" (more or less inspired) established by the Basel II Capital Agreement in order to determine the capital requirement for operational risk. Only the third methodology permits the measurement of potential losses registered by a banking society out of events generating operational risk.

### 3.2. Operational banking risk in Romanian legislation

Intensely discussed in the Basel II Agreement, the operational risk can be found in the Romanian banking environment before the Basel II Agreement. The first minimal structure of the significant banking risks is presented by the National Romanian Bank's Regulation no.17/2003 regarding the organisation and internal control of the credit institutions' activity and management of the significant risks, the organization and development of the internal audit in the credit institutions. Regarding the operational risk, it is defined as the national settlement as the risk of getting losses or not realizing the estimated profits, being determined by internal factors (the inappropriate development of some internal activities, the existence of inadequate people or systems) or external factors (economic conditions, changes in the banking environment, technological progresses). The legal risk is a component of the operational risk, arising due to not applying or defectively applying the legal or contractual regulations and negatively influences the operations or the credit institutions' situation.

The actual stage of development in the Romanian banking system reveals a banking system that needs to follow a complex transformation process for the premises of the Basel II Agreement's efficient application to be guaranteed. The first element that had to be configured was the specific national legislation. The National Romanian Bank is given an important part in this standardizing measure. The National Romanian Bank's activities during 2006-2008 show that the central bank has learned its lessons, has understood that in the Basel II "world" the rules of the game are complicated and has configured an action plan to face the Basel II challenges. The central bank has made public

its preoccupations in this domain and has also established a calendar of implementing the suggested actions.

We identify legal amendments made during 2006 and 2007 in operational banking risk domain. Also, the harmonization of the national legislation in the field with the European one continued in 2008, through transposition into the National Bank of Romania regulations of the guidelines issued by European System of Central Banks. The main settlements regarding the operational banking risk are:

- Government Emergency Ordinance No. 99/2006 on credit institutions and capital adequacy, as subsequently amended and supplemented by Law No. 227/2007 *settles* the general frame of risk management in banks. It shows that banks have to apply one of tree methods in operational risk administrating: the Basic Indicator Approach, the Standardized Approach and Advanced Measurement Approaches.
- Regulation No. 18/23/2006 issued by National Bank of Romania and National Securities Commission on own funds of credit institutions and investment firms *requires* credit institutions, Romanian legal entities, branches of third-country credit institutions operating in Romania, financial investment services undertakings, credit co-operatives within credit co-operative networks and investment management companies to maintain a level of own funds at least equal to the amount of capital requirements for credit risk, dilution risk, position risk, settlement risk, counterparty credit risk, currency risk, commodities risk and operational risk.
- National Bank of Romania Order No. 12/2007 on the reporting of minimum capital requirements for credit institutions *transposes* into the Romanian legislation the COREP (*Common solvency ratio reporting framework*) reporting forms drawn up by the Committee of European Banking Supervisors (CEBS), which stands for the instrument of banking supervision according to Basel II principles. The new norms require the observance, both on an individual and on a consolidated basis, of requirements for own fund structure and the capital requirements for credit risk, market risk, operational risk, dilution risk, position risk, settlement risk, counterparty credit risk, commodities risk.
- Regulation No. 5/2008 issued by National Bank of Romania on approving the use of Standardized Approach or Alternative Standardised Approach for operational risk *presents* the way through every banking society can apply one of two approaches in operational banking risk measurement.

But there are some regulations that will be finalised, such as those regarding the internal framework for activity management, internal process of assessing capital adequacy to risks and outsourcing of the activity of credit institutions and those regarding the validation of internal models for the assessment of operational risk.

### 3.3. Managing the banking operational risk

Nowadays, in Romania all the active banking societies must apply the following procedures for managing the operational risk: valuation procedures; monitoring

procedures and risk decreasing procedures, either in the internal field, by correcting in time the determined errors and by introducing adequate technologies for processing and insuring the information security, or by transferring the risk to other domains of activity (for example insurances against some events).

At a detailed study, these three types of procedures enforce the banks to develop activities which permit them the following:

1. For the *valuation procedures*, to identify, notify and quantify the banking operational risks they are confronted with. Identifying an event generating banking operational risk means establishing the moment (data) when the effective banking unit in the territory or the central administration of the bank takes knowledge of this event's happening for the first time, also including the existence of a real or potential compensation demand appeared in the bank. In this way, the banking society must take into consideration at least the following types of events generating the operational risk:

a) The internal fraud, identified in the shape of losses generated by acts as those committed with intention of fraud, fraudulent appropriation of goods (in a legal meaning) or infringement of regulations, legislation or politics of the credit institution, in which at least an inner person is implied; events as discrimination or infringement of diversity principles (for example bad-faith reporting the positions, theft, concluding of transactions by employees on their own).

b) The external fraud, identified in the shape of losses generated by acts as those committed with intention of fraud, fraudulent appropriation of goods or infringement of legislation, committed by a third party (for example robbery, fake, breaking informatics systems' codes).

c) Conditions for hiring the personnel and the safety of working place, identified in the shape of losses generated by actions contrary to the legislation and hiring, health and working safety regulations, by payment of compensations for body prejudices or by discrimination or infringement of diversity principles (for example compulsory demands of the personnel, not respecting the labour protection regulations, promoting discriminatory practices).

d) Deficient practices regarding the customers, products and activities – business practices, identified in the shape of losses generated by the not intentioned infringement or negligence of professional duties towards the customers (including those regarding trust or security and those regarding services' adequacy) or generated by the nature or characteristics of a product (for example inadequately using the confidential information about the customers, money laundry, selling unauthorized products, wrong use of products and services regarding the electronic banking system by the clients).

e) Endangering the tangible assets, identified in the shape of losses generated by destruction or deterioration of tangible assets as an effect of natural disasters or other events (for example terrorism or vandalism, acts fires and earthquakes).

f) Interrupting the activity and defective functioning of systems, identified in the

shape of losses generated by interrupting the activity or by inadequate functioning of systems (for example defections of hardware and software components, telecommunication troubles, defective projection, implementation and maintenance of the electronic banking system).

g) Execution, delivery and management of processes – the treatment applied for customers and commercial counterparts, as well as the defective processing of customers' data, identified in the shape of losses generated by inadequate operation of transactions or management of processes; losses from business partnerships (for example wrong recording the income data, defective management of the real guarantees, incomplete legal documentation, unauthorized access to the customers' accounts, disputes).

Banking societies have internal structures at the central administrations, through which they centralize the operational risk events from all the territorial units. The notification of a banking operational risk event is the action of reporting to the mentioned structure an operational risk event identified in the territorial banking unit or in the central administration of the bank.

2. For the *monitoring procedures*, registering and following the evolution of identified operational risk events. The organizational structures in each bank having responsibilities in managing the risks analyse the events generating banking operational risk and propose adequate measures, according to those events' gravity. Each banking society draws its own system of operational risk indexes, detailed on types of operational risk events.

3. For the operational risk *decreasing procedures*, the banking society draws its own procedures for correcting in time the errors that generate banking operational risk. The banking societies are also obliged to take measures for increasing the security of information processed in their territorial units and in the bank's central administration. Banks have the possibility to use alternative instruments for reducing the banking operational risk, as those offered by assurances, through which the risk is transferred to other domain.

## 4. Quantifying operational banking risk

### 4.1. Approaches permitted for quantifying the banking operational risk in Romania

According to the New Basel II Agreement the banking companies must accomplish specific capital requirements regarding the total credit, market and operational risk. The capital ratio is calculated using the definition of regulatory capital and risk-weighted assets and must be no lower than 8%, according to the 40 article from the Basel II Agreement:

$$\text{Total Amount of Capital/Risk} - \text{Weighted Assets} \geq 8\% \quad (1)$$

In the Basel II approach, average assets risk-weighted must include capital requirements for covering the operational risk.

The active banks in Romania must determine their capital necessary for covering the operational risk using one of the three means of quantification mentioned by the Basel II Agreement, assumed by the Capital Requirements Directive CRD and by the national legislation – the National Romanian Bank's regulation regarding the operational risk: *the Basic Indicator Approach, the Standardized Approach and Advanced Measurement Approaches*. Banks may choose one of the three methods mentioned above.

The first approach – the Basic Indicator Approach can be used by any bank, without being necessary the fulfilling of some extra requirements or the obtaining of approvals. Banks can calculate the necessary of capital for covering the operational risk applying the standardized approach and the advanced measurement approaches only after a pre-available approval from the supervising direction of the Romanian National Bank.

**4.2. The basic indicator approach**

Banking societies must permanently have funds for covering the operational risk to which they are exposed. In the framework of the base indicator approach calculating the capital required for covering the operational risk is done by applying the 15% quota upon a relevant indicator determined according to the methodology exposed below. The relevant indicator is calculated as an arithmetic average of the *annual gross results of the bank's activity* recorded by the credit institution in the last three ended financial exercises.

Banks using the basic indicator approach must hold capital for operational risk equal to the average over the previous three years of a fixed percentage (denoted alpha) of positive annual gross income. When calculating the average, figures for any year in which annual gross income is negative or zero should be excluded from both the numerator and denominator. The charge may be expressed as follows:

$$K_{BIA} = \left[\sum \left(GI_{1...N} \times \alpha\right)\right] / N, \qquad (2)$$

where:

$K_{BIA}$ = the capital charge under the basic indicator approach;

GI = annual gross income, where positive, over the previous three years;

N = number of the previous three years for which gross income is positive;

$\alpha$ = 15%, which is set by the Committee.

The gross result of the banking activity is determined as an algebra sum of some specific elements based on the elements from the profit and losses account at December 31, audited.

The negative or null values of the annual gross result, if such situations appear, are not considered in calculating the relevant indicator. In such cases, the relevant indicator is calculated through reporting the positive values' sum of the annual gross result to the number of years in which bigger than zero values has been recorded. If the credit institution does not have the necessary data in an audited form, it must use the estimations of those data.

We present an abridgement from Income Statement of a bank, with the necessary lines of the calculus of the gross annual result and the capital charge under basic indicator approach:

**The minimum necessary capital for the covering of the operational banking risk in the basic indicator approach BIA**

Table 1

- in RON (Romanian National Currency)

| No. | Elements from income statement | Year 2005 | Year 2006 | Year 2007 |
|---|---|---|---|---|
| 1. | Interest income and assimilated income, out of which: | 78,137,566.1 | 104,733,877.9 | 203,462,797.2 |
| *1.1.* | *From debentures and other fixed income bonds* | 832,174.3 | 17,720,234.5 | 39,701,945.9 |
| 2. | Interest expense and assimilated expense | 26,802,094.0 | 34,548,626.0 | 74,234,546.8 |
| 3. | Income from shares and other variable income securities | - | - | - |
| 4. | Commission income | 15,053,607.0 | 29,078,397.5 | 44,261,561.8 |
| 5. | Commission expense | 2,337,631.5 | 3,543,705.6 | 5,116,394.2 |
| 6. | Net profit/(loss) from financial operations | (5,285,912.2) | 10,101,591.7 | 12,956,099.8 |
| 7. | Other operating income | 2,042,768.7 | 1,270,116.6 | 509,685.7 |
| 8. | GROSS RESULT FOR THE YEAR (COL: 1-2+3+4-5+/-6+7) | 60,808,304.1 | 107,091,652.1 | 181,839,203.5 |
| 9. | Capital charge under BIA | 17,486,057.985 | | |

Because all three values of GI are strictly positive numbers, N will be equal to 3. In this case, capital charge under BIA takes value:

$$K_{BIA} = (60,808,304.1 + 107,091,652.1 + 181,839,203.5) \times 0,15/3 = 17,486,957.985\ RON$$

So, in 2008, the minimum necessary capital for covering the operational risk under Basic Indicator Approach is of 17,486,957.985 RON.

The current model in which is elaborated Income Statement in Romania permits the identification to all the necessary elements of the settlement of gross annual result, depending on which is established the prerequisite for extreme the covering risk operationally. This means that which banks makes ones choice for base approach in the quantification risk operationally, aren't obliged to achieve adjacent situations. The banks dispose of the primary information for the determination of the requirement of capital concerning the operational risk, on the strength of Income Statement.

### 4.3. The standardized approach

According to the standardized approach, banks' activities are divided into eight business lines. In the purpose of determining the capital request related to the operational risk, the banking societies have the obligation of establishing policies and adequate criteria of framing different activities on the eight lines and to transpose them clearly and transparently in the internal norms.

Yearly financial situations of an active banking society from Romania do not contain the detailed activities of the bank on the activity lines requested by the settlements according to the Basel II Agreement. In such context, every banking society which wants the quantification of

the banking operational risk through standard approach is obliged to configure its evidence system of the operations, based on which it can identify the eight activity lines according to the Basel II Agreement settlements.

Such a system can't be operational and efficient only though an integrated informatics application, of the level of the entire banking society, as well as at the level of the Central unit, as at the level of each territorial operative banking unit.

Because the measurement of the banking operational risk in standard approach imposes to the bank to establish the yearly gross incomes on activity lines from the last three years, the banking society must act post factum in grouping the activities on lines, for at least three financial closed exercises.

Grouping the activities developed by a banking society on activity lines, according to the requests from the standard approach of the operational risk, represents a difficult exercise for the bank. Information from the yearly financial situations that the bank is disposing does not allow it to classify the banking activities on lines, only after detailed analyzes.

For each of the activity lines, the banking society must establish the gross income, for the last three financial exercises closed. For this there are used information from the profits and losses account, which are presenting the expenses and incomes of the banking societies. Only that, the format of the profits and losses account of the active banking societies from Romania does not contain the activity lines settled by the Basel II Agreement.

Standard approach of the banking operational risk does not suppose sophisticated calculus for the banking units. *The difficulties are related of identifying correctly the activity lines*. Once established the yearly gross incomes for each activity line, it proceeds to effective calculating the needed capital for covering the operational banking risk.

Within each business line, gross income is a broad indicator that serves as a proxy for the scale of business operations and thus the likely scale of operational risk exposure within each of these business lines. The capital charge for each business line is calculated by multiplying gross income by a factor (denoted beta) assigned to that business line. Beta serves as a proxy for the industry-wide relationship between the operational risk loss experience for a given business line and the aggregate level of gross income for that business line. It should be noted that in the Standardized Approach gross income is measured for each business line, not the whole institution, i.e. in corporate finance, the indicator is the gross income generated in the corporate finance business line.

The total capital charge is calculated as the three-year average of the simple summation of the regulatory capital charges across each of the business lines in each year. In any given year, negative capital charges (resulting from negative gross income) in any business line may offset positive capital charges in other business lines without limit.

However, where the aggregate capital charge across all business lines within a

given year is negative, then the input to the numerator for that year will be zero. The total capital charge may be expressed as:

$$K_{TSA} = \left\{ \sum_{years:1-3} max\left[ \sum \left( GI_{1-8} \times \beta_{1-8} \right), 0 \right] \right\} \Big/ 3, \quad (3)$$

where:

$K_{TSA}$ = the capital charge under the standardized approach;

$GI_{1-8}$ = annual gross income in a given year, for each of the eight business lines;

$\beta_{1-8}$ = a fixed percentage, set by the Committee, relating the level of required capital to the level of the gross income for each of the eight business lines.

The values of the betas are: corporate finance – 18%, trading and sales – 18%, retail banking – 12%, commercial banking – 15%, payment and settlement – 18%, agency services – 15%, asset management – 12%, retail brokerage – 12%.

We present the activity lines for the gross income of a banking society during 2005-2007 and we calculate the capital charge for the covering the operational risk under the Standardized Approach:

**Yearly gross income of a banking society, detailed on activity lines**

Table 2

- in RON -

| Activity line | Gross income GI | | |
|---|---|---|---|
| | Year 2005 | Year 2006 | Year 2007 |
| Corporate finance | -27,610,785.7 | -34,256,450.6 | - 42,491,199.7 |
| Trading and sales | 12,721,043.7 | 27,276,700.7 | 57,277,132.3 |
| Retail banking | 0 | 0 | 0 |
| Commercial banking | 36,689,803.5 | 51,714,063.4 | 87,245,376.9 |
| Payment and settlement | 4,974,269.6 | 8,567,921.8 | 14,067,149.9 |
| Agency services | 0 | 0 | 334,647.2 |
| Asset management | 107,066.5 | 156,011.1 | 0 |
| Retail brokerage | 0 | 0 | 0 |

We are mentioning those elements that can not be framed in a certain activity line, had been take over in the first line corporate finance, which is weighted with a coefficient of maximum 18%. It can be observed the recording of some yearly negative gross income for dome activity lines, which leads to a negative request of capital for that activity line. This negative request line is deducted from the capital request belonging to the financial exercise to which is referring to.

The regulatory capital charges across each of the business lines for each three years are presented in the following table:

**Capital request for each banking activity line**

Table 3

- RON -

| Business lines | $GI_{1-8} \times \beta_{1-8}$ | | |
|---|---|---|---|
| | Year 2005 | Year 2006 | Year 2007 |
| Corporate finance | -4,969,941 | -6,166,161 | -7,648,416 |
| Trading and sales | 2,289,788 | 4,909,806 | 10,309,884 |
| Retail banking | 0 | 0 | 0 |
| Commercial banking | 5,503,471 | 7,757,110 | 13,086,807 |
| Payment and settlement | 895,368.5 | 1,542,226 | 2,532,087 |
| Agency services | 0 | 0 | 50,197.08 |
| Asset management | 12,847.98 | 18,721.33 | 0 |
| Retail brokerage | 0 | 0 | 0 |

The summation for each year, over all eight business lines will be:

**Capital request referring to the banking operational risk**

Table 4

- RON -

| Year 2005 | Year 2006 | Year 2007 |
|---|---|---|
| 3,731,533 | 8,061,702 | 18,330,558 |

Since all three values are positively, we obtain the following value for the capital charge under the standardized approach:

$$K_{TSA} = \frac{3,731,533 + 8,061,702 + 18,330,558}{3} =$$

$$= 10,041,265$$

So, in 2008, the minimum necessary capital banking studious society for the covering the operational risk under the standardized approach is of 10,041,265 RON. The same banking society had been studied through the basic indicator approach of the banking operational risk, situation in which had been obtained a value for the capital request for covering the operational banking risk of 17,486,957.985 RON.

We consider that the difference of capital between the two approaches, base and standard approach is considerable. In such a context, the banking societies should adapt the evidence and transactions recording system, so that it can apply the standard approach in quantifying the operational risk. This approach is also a starting point in implementing the most advanced shape of quantifying the operational banking risk – the advanced measurements.

### 4.4. The alternative standardized approach

By applying the alternative standardized approach, banks are able to find out the capital requirement for covering the operational risk, if they receive the previous approval of the National Bank of Romania's Surveillance Head Office. A bank may apply this type of approach of the operational risk if it carries on mainly retail banking business and/or commercial banking business, the obtained incomes being at least 90% of the bank's total incomes.

The methodology for determining the capital requirement for covering the operational risk using the alternative standardized approach is the same as for the standardized approach, except the two business lines: Commercial banking and

retail banking, for them the annual gross income is replaced by an alternative indicator for the normalized income, equal to 0.035 of the medium annual volume of loans and advances according to this two business lines, estimated on the basis of the data from the last three financial years.

### 4.5. The advanced measurement approach

Advanced approach measurements represents a set of operational banking risk's quantification methods, found in the Basel II Agreement. Advanced evaluation approach in quantifying the banking operational risk is not an accessible method to any credit institution, including also active banking company from Romania. On the other hand, banking companies are discouraged in applying this method by the complexity of evaluating methods, and, on the other hand, by the restrictions imposed by the national supervising authority – Romanian National Bank, in applying these methodologies of quantifying the operational banking risk.

In determining the capital requirements for covering the operational risk, institutions include also the expected and un-expected losses, so:

Capital Charge under AMA ($CC_{AMA}$) =
= Expected Loss (EL) +
+ Unexpected Loss (UL) (4)

If ELs are already captured in a bank's internal business practices, then capital charge set at the unexpected loss alone:

Capital Charge under AMA ($CC_{AMA}$) = Unexpected Loss (UL) (5)

In AMA approach, there is no specification regarding the analytic approach that has to be used by the banking companies. However, banks must demonstrate that their measurement system is sufficiently "granular" to capture severe tail loss events, e.g 99.9% VaR. Quantifying the operational banking risk must include also the low frequency risk events and with potential major negative effect, case given by the extremity of the statistic distribution curve, so that it will assure a rigorously standard compared to the a trust interval of 99.9% for a year time horizon.

Regarding the achievement of the mentioned rigorously standard, the operational risk quantification system of an credit institution must include a series of essential criteria, among which at least: internal data use, external data use, scenario analysis and business factors use and the internal control system. A bank needs to have a credible, transparent, well-documented and verifiable approach for weighting these fundamental elements in its overall operational risk measurement system. In such cases, scenario analysis, and business environment and control factors, may play a more dominant role in the risk measurement system. The correlations between the losses estimations from the operational risk can be recognized only if the institution can demonstrate adequately in the Romanian National Bank's opinion, which the correlation

measurement systems are rigorously, are correctly implemented and take into consideration the incertitude level corresponding to such estimations, especially in the crisis periods. Institution must validate the hypothesis referring to the correlations by using corresponding quantitative and qualitative techniques.

The operational risk quantification system must be well preserved on the internal plan and it must be avoided taking into consideration for more than one time the positive results of the qualitative evaluation or the diminution of the risk techniques, which have already recognized in other segments of the capital adequacy framework.

Operational risk quantifications generated by the institution must be substantiated on a *historical observation period of at least five years.* In the case in which an institution applies for the first time the advanced approach of quantifying the operational risk it can be accepted a historical observation period of *minimum three years.*

For applying the advanced evaluation approach in quantifying the operational risk, a credit institution must have *the capacity of splitting the internal historical data regarding the operational risk on some activity lines and loss events' categories* and can send these data to the Romanian National Bank, on its request. There are eight activity lines set through the Romanian National Bank's Regulation regarding the operational risk and they are according to the Basel II Agreement: *financing the commercial companies, transactions and sells, retail brokerage, commercial banking activity, retail banking activity, payments, agent services and assets' management.*

There are seven types of operational banking risk generator activities specified by the Romanian National Bank's Regulation regarding the operational risk and they are adapted after the Basel II Agreement: *internal fraud, external fraud, employment practices and working place safety, clients, products and business practices, damages upon the corporal assets, activity breaking and inappropriate functioning of the systems, execution, delivery and processes' management.* Criteria of allocating the losses on activity lines and on events' categories must be objective and well documented.

## 5. The Romanian banks' attitude in managing operational risk and, in following, the requirements for the banking capital adjustment

The national regulations in the field of banking capital adequacy, according to the Basel II Agreement, establish the two sorts of capital:

*1. Tier 1 (Core Capital or Basic Equity)* considered the key element of capital on which the main emphasis should be placed is equity capital and disclosed reserves. This key element of capital:

- is the only element common to all countries' banking systems;
- it is wholly visible in the published accounts and is the basis on which most market judgments of capital adequacy are made;
- it has a crucial bearing on profit margins and a bank's ability to compete.

This emphasis on equity capital and disclosed reserves reflects the importance the national supervisor authorities attaches to securing an appropriate quality, and the level of the total capital resources maintained by banks.

Tier 1 comprises the highest quality capital elements which fully satisfy all of the following essential characteristics:

- provide a permanent and unrestricted commitment of funds;
- be freely available to absorb losses;
- rank behind the claims of depositors and other creditors in the event of winding-up.

In Romanian banking system (pursuant to Regulation No. 18/23/2006 issued by National Bank of Romania and National Securities Commission on own funds of credit institutions and investment firms), Tier 1 capital consists of:

a) subscribed and paid-up share capital, except cumulative preferential shares or, as appropriate, the core capital made available to the branch in Romania by the third-country credit institution;

b) share premiums, received entirely, related to the equity capital;

c) legal reserves, statutory reserves and other reserves, as well as the retained earnings, following profit distribution;

d) net profit of the latest financial year, before its distribution in accordance with the decisions made at the General Meeting of Shareholders, to the limit of the amount intended to be earmarked for each of the destinations (stipulated under let. a) – c)).

*2. Tier 2 (Supplementary capital)* includes other elements which, to varying degrees, fall short of the quality of Tier 1 capital, but nonetheless contribute to the overall strength of an entity as a going concern. It is divided into: Upper Tier 2 capital – comprising elements that are essentially permanent in nature, including some forms of hybrid capital instruments which have the characteristics of both equity and debt; and Lower Tier 2 capital – comprising instruments which are not permanent.

In Romanian banking system (pursuant to Regulation No. 18/23/2006 issued by National Bank of Romania and National Securities Commission on own funds of credit institutions and investment firms), Tier 2 capital comprises:

a) base Tier 2 capital;

b) additional Tier 2 capital.

Base Tier 2 capital consists of reserves from tangible asset revaluation, adjusted for the related fiscal obligations, which are foreseeable upon calculating own funds and other items and perpetual securities and other similar instruments that fulfill cumulatively the specific conditions. To these may add the cumulative preferential shares (other than those representing items of the additional Tier 2 capital). The additional Tier 2 capital includes temporary cumulative preferential shares and the capital in the form of subordinated loans.

We present a case study of implementing current capital requirements at the level of a Romanian banking society. National Bank of Romania sets and monitors capital requirements for the banking society as a whole and requires the bank to maintain a prescribed ratio of total capital to total

risk-weighted assets. We analyze the bank's regulatory capital into two tiers:

- Tier 1 capital, which includes ordinary share capital, share premium, translation reserve and minority interests after deductions for goodwill and intangible assets and 50% of the interest in financial and insurance companies
- Tier 2 capital, which includes qualifying subordinated liabilities, fixed assets revaluation reserves after deduction of 50% of the interest in financial and insurance companies

The national legislation sets two capital ratio: *a risk-based capital ratio* (solvency ratio that will be >8%) and *ratio of Tier 1 capital to risk weighted assets*.

Under the risk-based capital adequacy framework, a Tier 1 and Tier 2 capital adequacy are measured by means of a risk-based capital ratio calculated by dividing its capital base by its total risk-weighted assets:

Solvency Ratio = Risk – based Capital Ratio = Capital base / Total Risk – Weighted Assets (6)

Ratio of Tier 1 capital to risk weighted assets shows Tier 1 capital as a share of total risk-weighted balance sheet assets and off-balance sheet items, net of provisions.

**A bank's regulatory capital position in accordance with the statutory regulations issued by the National Bank of Romania at 31 December year 2007**

Table 5

- RON -

| Indicator | 31 December 2007 | 31 December 2006 |
|---|---|---|
| *TIER 1 CAPITAL* | | |
| Share capital | 611,080 | 393,355 |
| Share premium | 98,601 | 94,199 |
| Translation reserves | 447,902 | 216,601 |
| Less intangible assets | (7,397) | (9,056) |
| Less 50% of the interest in financial companies | (73,483) | (35,868) |
| TOTAL | 1,076,703 | 659,231 |
| *TIER 2 CAPITAL* | | |
| Revaluation reserves | 26,896 | 9,855 |
| Subordinated liabilities | 243,485 | 236,764 |
| Less 50% of the interest in financial companies | (73,483) | (35,868) |
| TOTAL | 196,898 | 210,751 |
| Total regulatory capital | 1,273,601 | 869,982 |
| Risk weighted assets | 10,459,289 | 5,958,940 |
| *CAPITAL RATIOS* | | |
| Solvency ratio (total regulatory capital expressed as a percentage of total risk-weighted assets) | 12.18% | 14.60% |
| Ratio of Tier 1 capital to risk weighted assets (total Tier 1 capital expressed as a percentage of risk-weighted assets) | 10.29% | 11.06% |

*Findings.* The example has revealed that the bank recorded the lower solvency ratio (12.8 percent at end- N 2007, down 2.42 percentage points from end- N-1, 2006). The main factor behind this development is the ongoing expansion of non-government credit, given that bank's own funds posted a slower growth pace.

Nevertheless, the solvency ratio has been maintained at an adequate level, exceeding the minimum level laid down in prudential regulations applicable in Romania (8%).

An adequate level of capitalization indicators of credit institutions, including banks, secures the maintenance of the overall financial system stability, considering that these institutions are the key component of the Romanian financial market. The level of capitalization is relevant for the ability of credit institutions to absorb the losses generated by either exogenous shocks induced by the domestic and international macroeconomic environment, or by the inappropriate management of the endogenous risks associated with banking activity.

In the field of capital adequately, since 2007, the Romanian active banking societies, as credit institutions, had to *maintain permanently* the solvency ratio at minimum of 12% (according to article 7 of the National Romanian Bank's Regulation no. 12/2003 regarding the monitoring of the solvency and the high exposures of the credit institutions). Thereafter, the minimum solvency ratio was harmonized with the 8 percent level applicable in Europe (according to article 2 of the National Romanian Bank's Regulation no. 18/ 23/2006 on own funds of credit institutions and investment firms). The minimum level of the solvency ratio established in our country was higher than that of 8% presented in the Basel I Agreement, which denotes an attitude of prudence from the part of the regulatory authority in this domain – the National Bank of Romania.

According to Financial Stability Report for 2008, published by National Bank of Romania, in 2007, the downtrend followed in the past years by the overall solvency ratio of credit institutions was sharper, this indicator dropping 5.4 percentage points as compared to the end-2006, to 12.7 percent. The main factor behind this development is the ongoing expansion of non-government credit, given that credit institutions' own funds posted a slower growth pace. Nevertheless, the solvency ratio has been maintained at an adequate level, exceeding the minimum level laid down in prudential regulations applicable in 2007 in Romania (12%) and that required by European and international regulations (8 percent).

Amid the fast expansion in non-government credit, banks' tendency to migrate towards lower solvency ratios continued in 2007 as well. Hence, for the first time in the past eight years, three banks reported solvency ratios in a range between 8 percent and 10 percent, whilst other three banks recorded solvency ratios ranging from 10 percent to 12 percent. The largest concentration is seen in the range of 12 percent and 16 percent, as twelve banks reported solvency ratios within this range. At end-2007, only five banks posted solvency ratios higher than 30 percent, as compared with eight banks at end-2006.

Since 1st January 2008, as concerns the options of credit institutions, it is worth mentioning that banks, Romanian legal entities, *regarding the operational risk*, 22 banks, Romanian legal entities, opted for the Basic Approach, 9 banks for the Standardized Approach and one bank for the Advanced Measurement Approach.

It's obvious that only one of the Romanian banks applies the advanced measurement approaches in managing the operational risk. Banks are discouraged in applying this approach because the banks internal historical data regarding operational risk generating events either don't exist or are insufficient. The quality of the statistical data for supplying the internal models may be insufficient. And the external potentially operational risk generating events must be adequately estimated, and for this a bank needs adequate risk parameters. It is very difficult for a bank to estimate the probability and the impact of the banking operational risk generating events. The probability and impact of the risk events measuring scales (regarding the financial outcomes, strategic objectives, and the bank's reputation) are, in essence, subjective. Then these measuring scales must be correlated efficiently with operational risk events control procedures. In order to apply the Advanced Measurement Approaches a bank has to invest huge amounts for the support software applications, the training of the personnel and for the alternative instruments for managing the banking operational risk (insurance). The Advanced Measurement Approaches involve approvals for a bank from the National Bank of Romania based on complex studies and researches.

All of these aspects have discouraged the banks – Romanian legal persons – to apply the Advanced Measurement Approaches AMA. Also, the active banking institutions from Romania are not tempted to adopt in the near future internal methods for quantifying the operational risk, because the solvency is superior to the minimum level regulated at present in Romania (8%), therefore there isn't any stimulus for saving own funds by using more advanced methodologies. In the case of the banking institutions that are a part of multinational groups, the Romanian banking market may be considered too small at the group's level in order to justify the costs of implementing the Basel II advanced approaches, banks being oriented at the present towards the increase of the market rate.

We believe that for now, the first two approaches in quantifying of the operational banking risk are more suitable for the Romanian banking system, although the capital requirements for covering the operational risk are considered superior in these approaches unlike the Advanced Measurement Approaches. The present capitalization level of the Romanian banking system allows banks not to decide to implement the Advanced Measurement Approaches – an effective management of banking operational risk.

## Conclusions

We consider that the decisional factors from the banking societies perceive the Basel II Agreement firstly as an imperative frame for them to manage the banking societies and only after that as a possibility of efficient management of the banking societies. That's because the Agreement hasn't proved its importance for the credit institutions yet and its favourable effects for them. Otherwise, any new thing proves its utility and importance only after the practice has tested the theoretical settlements of that regulation.

All banks from Romania are still planning or in the process of implementing their plans for Basel II. The majority of banks are continuing to struggle with Pillar I (the minimum capital requirements necessary for covering specific risks of banking: credit risk, market risk and operational risk). For the second (the process of prudential supervision) and third (the market discipline) Pillars it was remark the absence of the banks concentration.

Each Romanian bank has adopted a certain strategy regarding the Operational Risk Management. The objective of the strategy regarding the Operational Risk Management is becoming conscious of the operational risk and of the responsibilities in managing this risk at the whole bank's level in order to maintain the risk at adequate parameters to permit the development of the bank's activity in optimum conditions. Banks have in place principles for managing the operational risk as well as procedures for monitoring, assessing and reducing the threat of events that might result in losses. The process of managing the operational risk is a cyclic one, meaning the repeated development of four steps (identification, valuation, monitoring and management) and means *identifying and catching the losses* generated by the operational risk's development. In this way importance is given to the identification of the type of followed losses, the persons responsible for reporting the losses, the criteria and methods of validating the registrations. After validating and insuring the information's consistency, these will be stored in a database regarding the losses from operational risk – "Loss Database", and this database will be the foundation for the future valuations of this risk. The database will contain information regarding the registered losses, and also regarding their retrieval, for example the retrieved amounts, the moment of retrieval, sources of retrieval etc.

To the initial costs regarding to Basel II implementing it be added continuous outgoes. This is especially in IT zone, for authorization and maintenance, and for specialized human resources qualifications in risk management. The banks will have to constitute the team which study the models of risk administrate and this operation cost very much. Foreign banks shareholders who are actively in Romania will make the decisions for sustain or not these costs, considering this factor: banking market quota in Romania. It is a lot of worries that a lot of banks in Romania will be applied the based Approach Basel II, because of big outgoes for Basel II implementing.

However, it is difficult to establish the impact of the entry into force of new prudential regulations regarding capital adequacy, which stipulate the enforcement of Basel II principles from 1st January 2008. We consider that there is a major risk for banks (especially for the banks whose solvency ratio is close to the 8 percent minimum level) to have solvency problems. This risk is associated with the difficulty to currently assess (at the end of 2008) the impact exerted by the entry into force of the new prudential regulations on capital adequacy, which set forth the enforcement of Basel II principles since 1 January 2008.

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