

# The Operational Risk – Minimum Capital Requirements

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***Abstract.** This paper aims to present how to quantify the minimum capital requirement for operational risk using three approaches proposed by the Basel Committee to identify optimal allocation of capital, given that until recently to this risk has been allocated a minimum attention, considering that it has a low impact on the business of financial institutions.*

**Keywords:** basic indicator approach; the standardized approach; internal measurement approach; the expected loss; unexpected loss.

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**JEL Code:** G32.  
**REL Code:** 11C.

To satisfy the first pillar of the Basel II on the minimum capital required to cover operational risk, a financial institution in Romania, which we will not specify names due to confidentiality, uses an advanced model for measuring operational risk which is aimed at locating potential risks to the goods and/or support activities, in order to estimate the potential impact.

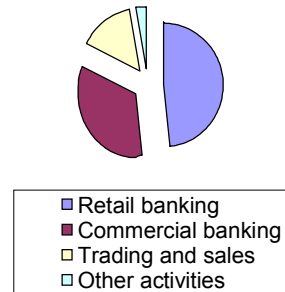
Work undertaken by the credit institution in a group may be classified, as recommended by the Basel Committee, four categories, namely: trading and sales, retail banking, commercial banking and other activities (including the overlapping activities of corporate finance, payment and settlement, agency services), monitor the operations performed on the basis of policy and specific criteria, developed and transformed in internal procedures.

For all business lines of credit institutions used as an indicator showed “gross income”<sup>(1)</sup>, deeming it, and according to recommendations by the Basel Committee, a transparent indicator present in the financial statements on annual basis with can be easily accomplished calculations and national and international comparisons, are easily audited and reflecting well sensitivity operational risk.

To determine the capital requirements under the related operational risk based approach it will be applied the factor of 15% on average gross income obtained during three consecutive years.

In case where the standard model for determining the capital requirements is applied the process of allocation of gross income for each business line has to be started and then the average gross income

for a period of three years, corresponding to each business line will apply the appropriate risk weight<sup>(2)</sup> to determine the capital requirement.



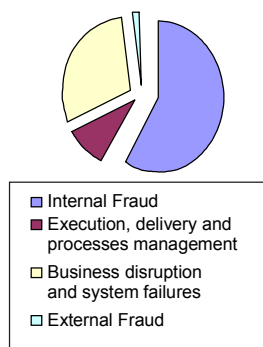
Source: Own processing.

Figure 1. The capital requirement under the Standard Approach for business line

As can be seen from Figure 1, when high values for the business line activity in retail banking are obtained reveals the size and intensity of gross income business establishment concerned in that sector, also providing information to the departments concerned about potential losses that may occur and the amount necessary to cover losses related to operational risk on that business line.

Analyzing Figure 1 we can conclude that the most risky business lines are those of commercial banking and retail, which is due in particular to the errors and transaction processing that may arise in the activities of the bank, explained by errors occurring when customers opened accounts such as the introduction of erroneous data in the system, incomplete documentation, lack of signatures, wrong classification of the client, etc.; errors in the vault, which include: un check client’s signature, the issuing of

documents for non-exchange rate, etc.; errors occurred when payment: unauthorized payment, late payments, incorrect choice of currency at the time of payment, the transmission delay of payment orders, the same transmission multiple orders, entering incorrect data into the system, the loss of check-ROMs, compensation instruments false debit, etc.; errors occurring in the exchange rate: failure rate regulation, wrong understanding of the sense of exchange, etc.; IT errors: erroneous transfer of data, system downtime, etc.; fraud occurred in lending: the acceptance of incomplete records, falsifying information, the use of identity false, etc.; errors in making the attachment, which can include: delays in the transmission of notices, lock, unlock unauthorized accounts, violation of regulations and rules, etc.; errors in managing complaints, such as retrieving or late reporting by departments authorized transmission of late responses etc. complaints.

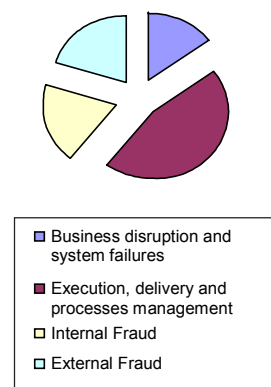


Source: Own processing.

**Figure 2.** *The probability of occurrence of events causing loss*

The most frequent losses, as can be seen from Figure 2, were due to human error, being considered a risk related to human

resources in the carrying out unauthorized activities because of negligence or intentional in the form of unreported transactions, unauthorized, unregistered operations, reporting dishonesty positions etc. The second place is occupied by losses due to business disruption and system; this is due to disruption of operations or system crashes and are unavailability risks resulting from hardware or software systems, data quality, problems with computer programs, failure of components, problems related to telecommunications, software, design, implementation and maintenance of the poor “electronic banking”, etc. overuse utilities.



Source: Own processing.

**Figure 3.** *Operational loss suffered by type of event for the credit institution*

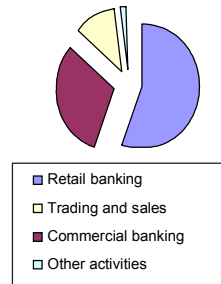
In terms of severity events the conspicuous place is occupied by the events occurring due execution, delivery and processes management which re characterized by events such as erroneous communications, models or systems downtime, poor preservation of databases, errors in the introduction, operation, storage and update data breach terms of powers or

lack of documents, losses, damages on the customers, outsourcing process, with controversy, etc., due to partial or total lack of legal documents; erroneous communications, models or systems downtime; loss or damage created due to customer negligence, breach of deadlines, reporting obligations or duties; input errors, operating, storing or updating data, negligence in maintaining databases, etc. failed deliveries.

Next we use an advanced model, the Internal Assessment Approach (IMA), to determine the requirement for operational risk related capital. Thus the first step is to achieve operational risk matrix, in which case the credit institution will be made up of 16 cells, corresponding to four business lines<sup>(3)</sup> and four events types<sup>(4)</sup>.

Calculation of capital requirement under this approach will be achieved through the following steps:

a) for each business line have resulted in gross revenue, which we will summarize in Figure 4.



Source: Own processing.

Figure 4. Average gross income on business line

b) calculating parameters:

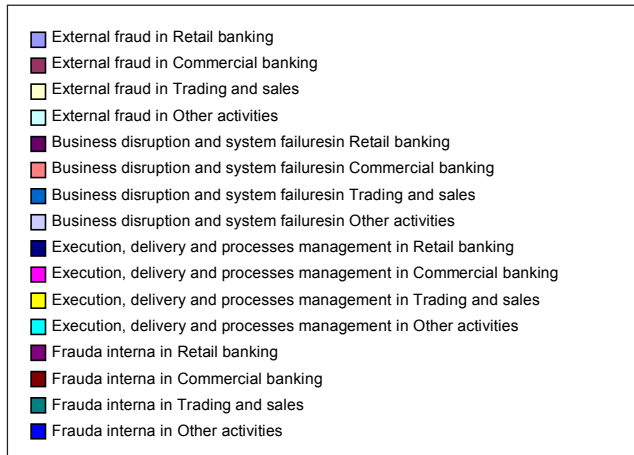
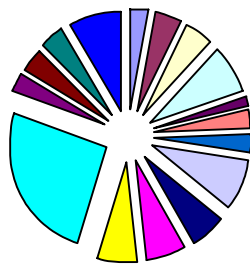
- Probability of occurrence of events causing loss (PE - Probability of Loss Event) which is used for internal historical data on the number of transactions concluded by operational losses and the total number of transactions completed on business line



Source: Own processing.

Figure 5. Probability of occurrence of loss events for each cell of the matrix operational risk

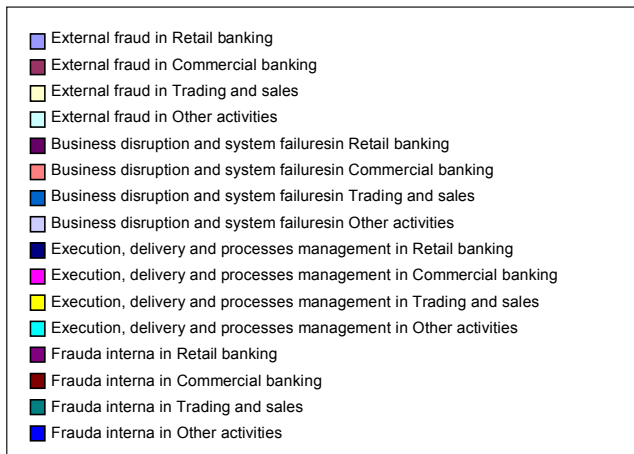
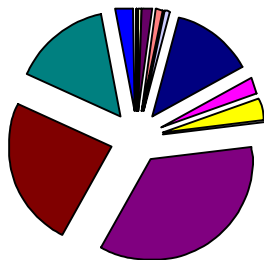
- The proportion of exposure that will record as operational loss (LGE - Loss of Given Event)



Source: Own processing.

Figure 6. Proportion of exposure that will record the loss for each operational cell

c) Determining the expected loss (EL - Expected Loss) as the product between the parameters determined previously and gross revenue.

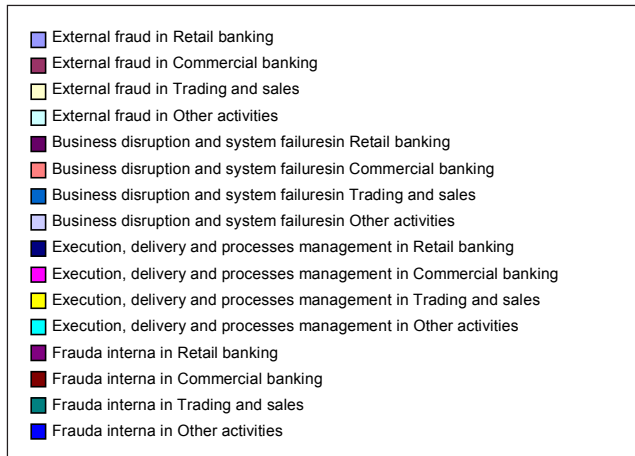
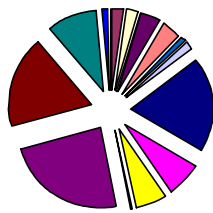


Source: Own processing.

Figure 7. Expected Loss for each cell of the matrix operational risk

d) Determining the unexpected loss (UL - Unexpected Loss) as a product of the expected loss of the credit institution and the maximum amount of a loss for a period of one year and a confidence threshold of 99.9%. Thus the maximum amount of loss will be calculated for each cell of the matrix

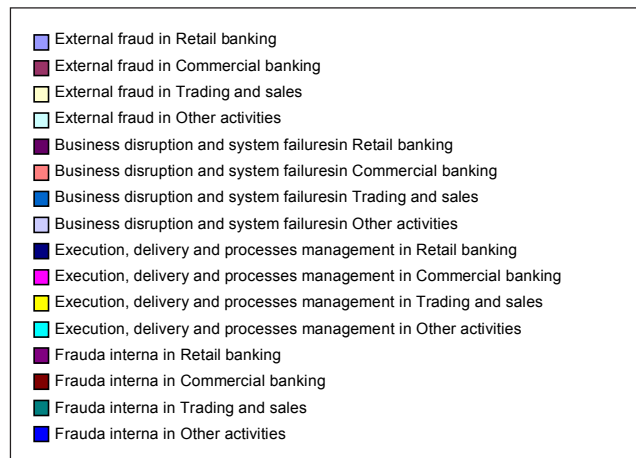
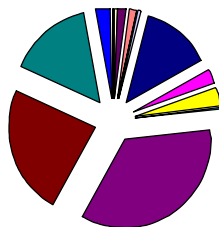
operational risk as a ratio between cell multiplier and square root of the number of transactions concluded with operational losses. The multiplier cell has to be estimated using normal distribution, distribution losses, and the corresponding value in the table for a confidence threshold of 99.9%.



Source: Own processing.

Figure 8. Unexpected loss for each cell of the matrix operational risk

Capital allocated by the credit institution shall be determined as the sum of expected loss and unexpected loss for each cell of the matrix operational risk, as shown in the following figure:



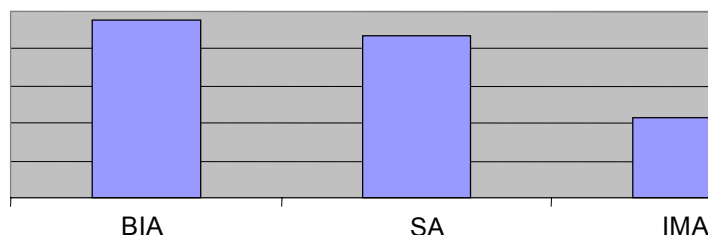
Source: Own processing.

Figure 9. Capital requirement under Internal Measurement Approach attached to each cell of the matrix operational risk

e) Finally, to determine capital requirements under the Internal Measurement Approach for the entire institution of credit there will be summed the capital requirements related to each cell of the matrix of operational risk. Thus, synthesizing the analysis of the

credit institution for consideration, we can see, and in Figure 10, that once the bank uses a method of measuring the more complex operational risk, capital requirement related to this risk is diminishing. Thus the minimum

capital is mobilized using Internal Measurement Approach, as it can identify, measure and more effectively manage operational risks being able to discover in which line of activity is a higher operational risk and are the most important risk factors.



Source: Own processing.

Figure 10. Capital requirement under the three approaches

## Notes

- <sup>(1)</sup> The amount of the profit and loss account of the outcome of interest and similar income from shares and other securities with variable income, the result of commissions, the result of financial operations and other operating income.
- <sup>(2)</sup> Retail banking: 12%; commercial banking 15%; trading and sales and other activities 18%.
- <sup>(3)</sup> Same as for Standardized Approach: retail banking, commercial banking, trading and sales and other activities.
- <sup>(4)</sup> External fraud, internal fraud, business disruption and system failures, execution, delivery and processes anagement.

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