Operational Risk – An Assessment at International Level[1]

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***Abstract*—** In recent years, thanks to the development of new products and activities have been a number of changes occurring in the banking and financial markets worldwide, and default risk became much larger and more complex. This was given to the increased importance of identifying and measuring risk and capital adequacy of financial institutions. Cases resounding operational losses have led to increased attention on operational risk management. The purpose of this article is to create an operational risk analysis worldwide. Such work is structured in three parts: first presenting theoretical information related to operational risk, the second will contain analysis on this type of risk, and the final will serve to identify results.

***Keywords*—** business line, event type, frequency, operational risk, severity.

I. INTRODUCTION

A very important segment of the economy that works as a whole is the banking system and it aims creating a more robust and stable framework to deal with the unexpected systemic risk, and to provide accurate information for financial market participants. Any entity seeks to maximize the revenues, a vital component of proper management of all economic activities, and to reduce the risk.

Starting from the capital adequacy requirements on financial institutions in the context of Basel II, we proposed to study the theory and practice in the field in order to highlight the positive effects of applying these rules and identifying new solutions that could bring added novelty to this theme. Although operational risk in the past was treated as a risk that can not endanger the existence of financial institutions, considering the cases resounding losses occurred, we can say that it is not negligible and we should pay attention. Operational risk materializes in financial losses from internal or external events or trends or changes due to corporate governance and internal control systems, policies, organization, ethical standards and other controls and standards institution.

Operational risk was defined by the Basel Committee as a "risk of direct or indirect loss resulting from weaknesses or deficiencies in procedures, personnel, internal systems or external events, having a main component of legal risk that arises from the non-application or application defective legal or contractual provisions or adversely affect the Bank's operations, but excludes strategic risk[2] and reputational risk[3].

Reason [9] for which the Basel Committee does not include the latter type of risk in the definition of operational risk is the fact that although the reputation risk can be identified, the consequences appear to be very diffuse and specific pre-calculated data. While operational risk is likely to be linked to causative factors and estimated to be discreet, and thus operational risk becomes better known, but it's not the case with regard to the preponderance of information and technology.

II. PROBLEM FORMULATION

In 2009 the Basel Committee on Bank Supervision published the results of Loss Data Collection Exercise for Operational Risk attended by 121 banking institutions in 17 countries, among which we mention Canada, the United States, Netherlands, Belgium, Switzerland, France, Germany, United Kingdom, Italy, Luxembourg, Poland, Spain **embedded in your document.** The figures and tables you insert in your document are only to help you gauge the size of your paper, for the convenience of the referees, and to make it easy for you to distribute preprints etc.. As it is noted in Fig.1, the participants in this exercise were divided into five areas, namely Australia, Europe, Japan, North America, Brazil and India.

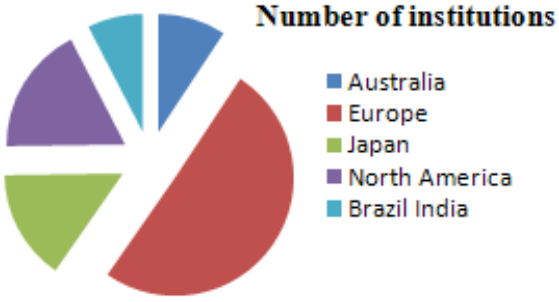

Fig. 1: NUMBER OF PARTICIPANTS

Data collected at the international level came from the bank sizes and different risk profile in order to experience the benefits of operational risk losses and practices. The exercise had as objective to identify the credit institutions that have implemented and used one of the approaches proposed by the Basel II capital calculation for operational risk, namely:

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[2] Strategic risk is associated with the mission and overall business strategy and is aimed at the major factors that may affect the company's ability to achieve strategic objectives, among which we mention: the organizational structure of business, human resources, market share, and reputation. It is inherent in any selection of markets, products and geographies that define the bank's strategy involve a complex environment and express the probability of choosing the optimal strategy under the circumstances.

[3] Reputational risk is the risk of loss or failure to record the estimated profits due to bad publicity which leads to lack of public confidence in the integrity of the institution. Among the sources of this risk can include: lowering the rating following tests carried out by specialized agencies, launched negative rumors, reporting poor financial results, etc., the immediate consequence of the fall in stock market value of bank shares.

- Basic indicator approach (BIA) - Capital requirement is determined by applying a rate of 15% of gross income (net interest income and net income other than interest (as defined by national supervisory authority and / or national accounting standards). Committee intended to eliminate provisions, operating expenses (fees paid less and outsourcing service providers, while income earned by the bank for the same type of services should be included), the profit or loss from the sale of bonds (excluding those classified to hold to maturity "or" for sale) and extraordinary or irregular income categories. Exposure indicator is calculated before deduction of provisions and other operating expenses. This does not include: profits / losses on sale items not included in the trading, insurance income and extraordinary income in the last three years the bank.

$$K_{BIA}=\frac{\alpha\sum_{i=1}^{n}GI_i}{n} \quad 4$$

- Standardized approach (SA) - Capital requirement is determined by applying a rate between 12% and 18% of gross income, after organizing the financial institution in eight standard business lines. Thus for: Retail Banking, Asset management, retail broking percentage is 12% Commercial Banking Services, the share is 15% agent, corporate finance, trading and sales, payments and settlement share is 18% .

$$K_{SA}=\frac{\sum_{n=1}^{3}\max[\sum_{i=1}^{8}\beta_i GI_i,0]}{n} \quad 5$$

- Advanced method approach (AMA) - For advanced evaluation methods the minimum needed to cover operational risk capital is based on internal models and integrated risk management process and validated internally and externally, by the supervisory authority and by a specialist auditor. Thus, the institutions provide flexibility in the design of methods that allow computation of the minimum level of common equity for operational risk profile, appropriate to their activities and subsequent risk. To determine the capital requirements for operational risk using the advanced approach it can be used one of the methods:

1. Internal Measurement Approach;

$$K_{IMA}=\sum_{i=1}^{8}\sum_{j=1}^{7}[\gamma(i,j)EI(i,j)PE(i,j)LGE(i,j)] \quad 6$$

[4] K_{BIA}= Capital requirement;
GI= gross income
n= number of years preceding the last three years for which income was positive
α= rate of 15%

[5] K_{SA}= Capital requirement;
GI_i= gross income for business line i;
i= business line;
n= financial years which make up the arithmetic mean to determine the total capital requirement, related to operational risk exposure;

β_i= weighting coefficient determined by the Basel Committee, on balance the relevant indicators on business lines.

[6] K_{IMA}= Capital requirement;
i= business line;
j=event type;
γ= Factor determined by the supervisor for each line of business, that makes the expected loss in capital requirements, which is defined as the maximum loss for a period and a specified confidence interval.
EI = exposure indicator
PE = probability of an event generator losses
LGE = loss that occurs in the event of such an event

2. Loss Distribution Approach;
involves the following steps:
a. Modeling the severity of events that leads to losses resulting statistical distribution and shape based on historical data;
b. Modeling the frequency of events that leads to losses resulting form of the probability distribution and scale based on the bank's operations and existing internal control system, which will provide information on the number of losses that occur for a period of time.
c. Distribution of annual loss is not as usual, and therefore Closed form solutions are used (convolution, Fourier transform) or Open form solutions (Monte Carlo simulation) to estimate the expected loss and unexpected objective. Expected loss is typically defined as the average distribution loss [11].
d. Obtain Capital at Risk (CaR) using composite distribution for each risk class. According to Basel II regulatory capital should be calculated as the sum of expected loss and unexpected loss for a period of one year and a 99.9% confidence interval. $CaR(i,j,\alpha)=EL(i,j)+UL(i,j,\alpha)$[7]. Capital Allocation: $UL=VaR-EL$[8], with Probability $(Loss \leq VaR)=0999$. Allocated capital is supposed to cover only unexpected losses as expected losses are covered by the provisions established.
e. Finally get the whole bank economic capital as the sum of capital reserves for all classes of risk: $CaR(\alpha)=\sum_{i=1}^{8}\sum_{j=1}^{7}CaR(i,j;\alpha)$. [9]

3. Scorecard Approach determine an initial level of capital for operational risk, which changes over time to include fundamental risk profile of different business lines. This approach applies to pursue a qualitative reasoning, relying less on historical data $K(i,j)=EI(i,j)\times\omega(i,j)\times RS(i,j)$[10] is preferred when conducting a management operational risk, as identified number of risk indicators, which may indicate the risk due to fundamentals.

The qualitative risk assessment scorecard transforms into a

[7] $CaR(i,j,\alpha)$= Capital at Risk for business line i and event type j and confidence interval α;
EL(i,j)= expected loss for business line i and event type j
$UL(i,j,\alpha)$= unexpected losses for business line i and event type j and confidence interval α;

[8] UL= unexpected losses
VaR= Value at Risk
EL= expected losses

[9] $CaR(\alpha)$= bank economic capital
$CaR(i,j,\alpha)$= Capital at Risk for business line i and event type j and confidence interval α;

[10] $K(i,j)$=Capital requirement for business line i and event type j
EI(i,j) = exposure indicator for business line i and event type j
RS(i,j) =risk score for business line i and event type j
ω(i,j) =sizing factor for business line i and event type j

risk score. With this method can analyze the influence of indirect indicators of potential operational risk losses that are indirectly the magnitude of operational risk. In this approach the banks seek to improve risk control will reduce the frequency and severity of future operational losses.

The distinction between the first two models is given by the nature of the data. If at the aggregated level, the losses are individual or not, it is preferable to use the loss distribution model.

Scorecard and LDA approaches statistical model is based on VaR, the institution must assess each cell matrix business line / event type probability distribution and severity of operational losses and operational VaR represents the amount of capital appropriate for each cell.

The events that can cause operational risk loss might be:
– Losses related to the financial account operations that are recorded in the results, and after that are taken into consideration in computing the required capital for operational risk (fines, penalties, theft of cash, replacement cost to correct an error when performing an operation stock etc.).
- Losses generated by the risk of the internal market, taken into consideration in computing the required capital for operational risk (a market loss because of an error in management positions);
– Losses encountered because of internal credit risk associated with a related credit risk/counterparty and operational risk event (inadequate guarantee for funding the grant of an insolvent counterparty, failure condition imposed by the Guarantee Fund).
- Losses generated by the fact that net banking product, which can not be recovered, are taken in computing the required capital for operational risk (temporary closure of an agency, service, availability of an agency, ATM, etc).
– Losses generated by reputation damages and measures to control this risk (computer piracy attempt to give statements in the media containing confidential information(customer response and third parties) with an impact on the institution's image and ways of putting into practice the communication plan of the credit institution).

According to the data in Figure 2 an important progress was made in the collection and use of internal data held since 2002.

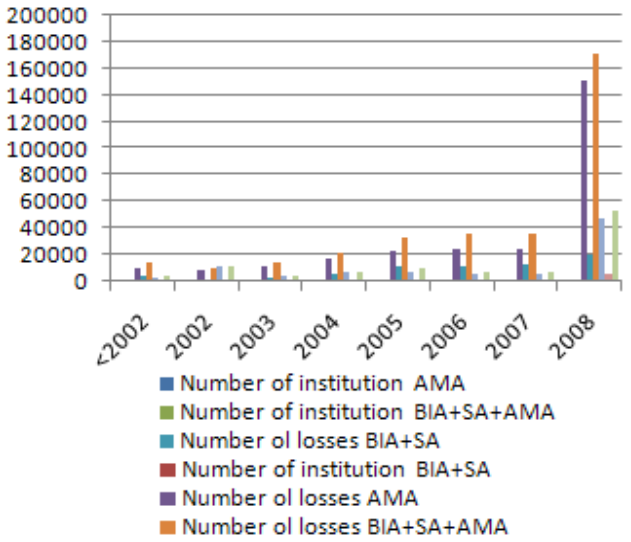

Fig. 2: LOSS DATA BY YEAR

As we can notice in Fig.2 significant differences arising from of the number of events that the value of the loss of credit institutions that use advanced methods and those using the indicator method and the standardized differences can be explained by the activity performed, considering that advanced method is usually used by large banks.
The fact that they have a data collection process much better developed, considering that it is a requirement that must be met by a financial institution, it creates flexible methods which enable the computation of minimum level of own funds for operational risk according to their business profile and subsequent risk.

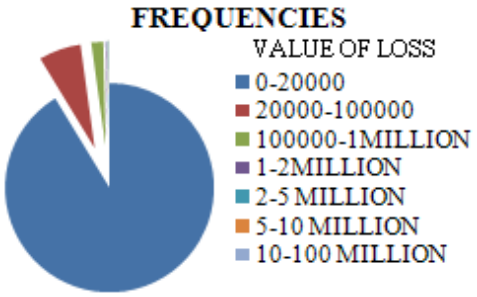

Fig. 3: NUMBER OF LOSSES ACROSS SEVERITY OF LOSS

As you can see in Fig. 3 most losses due to operational risk were below 20 000 euro, while the losses over 100 million euro have a share of only 0.02%. In terms of severity, the value loss results are shown in Fig.4.
There are three types of severity associated operational losses which must be taken into account, namely:
- Low severity occurring more frequently, which will constitute the body distribution
- High severity that occur sporadically, which will form the tail distribution
- Catastrophic severity occurring several times in a long time.
While small losses are very frequent, large losses are rare, implying that institutions are well documented and legally on

the causes of small losses, but those are totally unprepared in terms of characterized by high severity

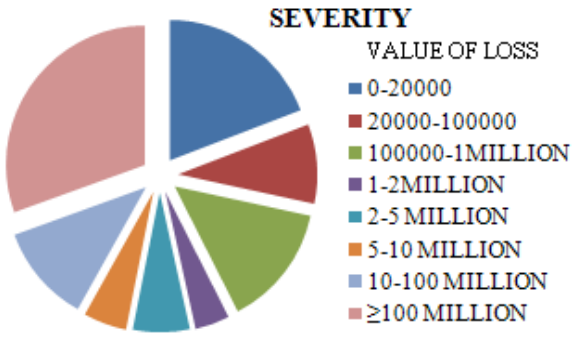

Fig. 4: LOSS AMOUNT ACROSS SEVERITY OF LOSS

Given the fact that financial institutions have a highly developed internal database containing past events related to operational losses, loss frequency modeling is quite limited. Using potential models for determining the number of losses they may suffer a bank at a time, we identified that:

- Poisson distribution[11], has one parameter which equals the average variance and describes the number of events occurring at a time while the probability of occurrence of the event is very small, but very large number of experiments [6]. This distribution is a stable distribution but requires a constant rate of occurrence of loss of time, what actually happens.
- Binomial distribution[12] is a discrete distribution characterized by two parameters (number of events and the likelihood). For the parameters the average is higher than the variance.
- Negative binomial distribution[13] - it has two parameters where the average is less than the variance.

[11] is a discrete distribution to choose the positive integer values. This is a model for the number of events that can occur in a period of time for which the intensity is constant. Domain of definition $[0;+\infty)$; probability density function:

$$f(x)=\frac{\lambda^x e^{-\lambda}}{x!}$$

[12] is a discrete distribution to choose the positive integer values. Domain of definition $[0;+\infty)$; probability density function:

$$f(x)=\binom{n}{x}p^x(1-p)^{n-x}$$

[13] The probability mass function

$$f(k)=\Pr(X=k)=\binom{k+r-1}{k}(1-p)^r p^k$$

for $k = 0,1,2\ldots$

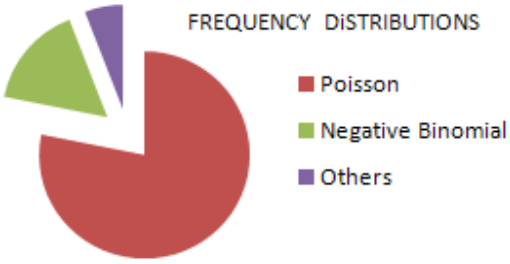

Fig. 5: FREQUENCY DISTRIBUTIONS

Taking into consideration that the credit institutions have a highly developed internal database containing past events related to operational losses, loss frequency modeling is very developed as well, using as potential models for determining the number of losses they may suffer a bank at a time the distribution used to determine the frequency of operational loss is Poisson distribution, Fig.5.

The most important choice is the technique that models operational loss severity. Several distributions can be used for modeling loss severity [5], in order to see which one fits best database: Exponential distribution[14], Weibull distribution[15], Gamma distribution[16], Loggamma distribution[17], Pareto distribution[18], generalized Pareto distribution[19], Burr

[14] It is a continuous distribution characterized by a parameter (β average distribution). Domain of definition [0, +) density function

$$f(x)=\frac{e^{-(\frac{x}{\beta})}}{\beta}$$

[15] It is a continuous distribution characterized by two parameters varies greatly and depend on the arguments in (α shape parameter and β scale parameter). Domain of definition [0, +) density function

$$f(x)=\frac{\alpha x^{\alpha-1}}{\beta^{\alpha}}e^{-(\frac{x}{\beta})^{\alpha}}$$

[16] It is a continuous distribution characterized by two parameters varies greatly and depend on the arguments in (α shape parameter and β scale parameter). Domain of definition [0, +) density function

$$f(x)=\frac{1}{\beta\Gamma(\alpha)}(\frac{x}{\beta})^{\alpha-1}e^{-\frac{x}{\beta}}$$

[17] Domain $x\geq\lambda$; probability density function:

$$f(x)=\frac{(\ln[x-\lambda+1])^{\alpha-1}(x-\lambda+1)-(\frac{1+\beta}{\beta})}{\beta^{\alpha}\tau(\alpha)},\alpha,\beta>0$$

[18] It is a continuous distribution characterized by two parameters varies greatly and depend on the arguments in (α shape parameter and β scale parameter). Domain of definition [β, +); density function $f(x)=\frac{\alpha\beta^{\theta}}{x^{\alpha+1}}$

[19] Probability density function

$$y=f(x|k,\sigma,\theta)=(\frac{1}{\sigma})(1+k\frac{(x-\theta)}{\sigma})^{-1-\frac{1}{k}}$$

with shape parameter $k\neq 0$, scale parameter σ, and threshold parameter θ, for $\theta<x$, when $k>0$, or for $\theta<x<-\sigma/k$ when $k<0$.

distribution[20], Lognormal distribution[21], Loglogistic distribution[22], Generalized beta distribution of second category (GB2) [23] and G-and-H distribution[24].

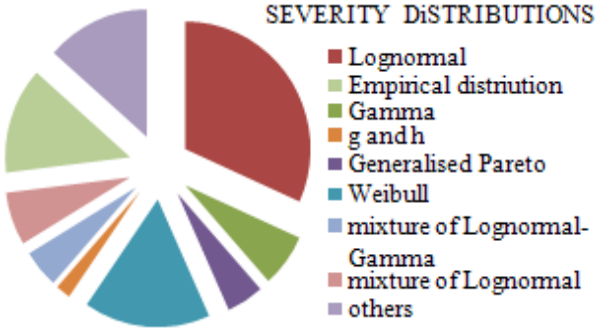

Fig. 6: SEVERITY DISTRIBUTIONS

Given that credit institutions have a highly developed internal database containing past events related to operational losses, most of them use for computing the severity distribution, the distribution Lognormal followed the Weibull distribution as shown in Fig. 6.

It may be used for modeling loss severity of several distributions, also: exponential distribution, Log-gamma distribution, Pareto distribution, Burr distribution, Log-logistic distribution, Generalized Beta Distribution Category Two (GB2) and g-and-h distribution. Considering that the operational frequent lost (the body of the distribution) is different and behave statistically different for rare and high values (the tail of the distribution), the distribution of some financial institutions is a different distribution in the body and in the tail. It must be paid attention to data-out threshold, because it has a strong effect on afferent measuring operational risk capital.

Basel Committee on Banking Supervision has identified seven types of operational risk categories, namely:

- Generating internal fraud losses due to intentional non-compliance with national rules, company policy or laws involving at least one employee of the company, performing unauthorized activities (products negligently or intentionally, in the form of unreported transactions, unauthorized operations unregistered bad-faith reporting of positions, etc..) theft or fraud (fraud with credit / deposit worthless, the conclusion of transactions by insiders of their own, theft, robbery, wrongly attributed to active destruction of property, forgery, fraud, etc.), excluding events such discrimination or violations of the principles of diversity.
- External Fraud generating business losses due to a third party for the purpose of fraud, avoid compliance or to acquire goods / values, violations of security systems (hackers, information theft, robbery, forgery, computer system-related cracking, the credit institution's commitments resulted in counterfeit electronic money fraudulently) theft and fraud (theft, forgery, etc.).
- Risks arising from clients products and business practices - related to neglect to fulfill professional obligations to clients or the nature and design-related product, such as compliance, completion and prices (abuse of procedures, false contracts, aggressive sales, change of accounting records , misuse of confidential information held about customers, improper loans), market practices or improper business (money laundering, antitrust, improper trading, handling market, unlicensed activity) losses due to product (selling unauthorized products, designs and products erroneous misuse by customers of products and services related to the "electronic banking") credibility, sustainability and transparency, selection, sponsorship and exposure (exposure limits applicable to the customer, client failure to investigate false registration data entry, administration faulty collateral, registering losses or additional commitments from customers for access to the system flawed, incomplete legal documentation, unauthorized access to customer accounts, litigation) consultancy activities (discussions on performance and counseling activities).
- Damage to physical assets embodied in damage or loss of physical assets and their impact on the organization of its work: disasters and other events (disasters, fires, earthquakes, explosions, aircraft crashes, shipwrecks, telecommunications and power shortages, acts of terrorism, vandalism or other events.
- Business disruption and system failures are risks resulting from the unavailability of systems (hardware or software, data quality, problems of computer programs, component failures, telecommunication problems, software, design, implementation and maintenance of the system failure "e-banking "overutilization utilities).
- Execution, Delivery and Process management, occurred due to poor uptake and poor execution of transactions

[20] Continuous probability distribution for a non-negative random variable. It is also known as the Singh-Maddala distribution and is one of a number of different distributions sometimes called the "generalized log-logistic distribution"; probability density function:

$$f(x,c,k) = ck\frac{x^{c-1}}{(1+x^{c})^{k+1}}, c>0, k>0$$

[21] Density function $f(x) = \frac{1}{x\sigma\sqrt{2\pi}}\exp[-(\frac{\ln x - \mu}{\sigma\sqrt{2}})^2]I_{\alpha;\infty}(x)$, where $\mu \in \Re$ and it is the mean, $\sigma > 0$ represent standard deviation of lnX;

[22] Density function $f(x) = \frac{|a|x^{ap-1}}{b^{ap}B(p,q)[1+(\frac{x}{b})^{a}]^{p+q}}I_{(0;\infty)}(x)$, where B(p,q)= beta function, a, b, q are location, shape and scale parameter

[23] Density function $f(x) = \frac{\eta(x-\alpha)^{\eta-1}}{[1+(x-\alpha)]^2}I_{\alpha;\infty}(x)| \ |$,

[24] Density function $f_{g,h}(x)=A+B(e^{gx}-1)\ \frac{\exp(\frac{hx^2}{2})}{g}$, where A, B, g si h ≥ 0 are de parameter of distribution.

(communications errors, data entry, maintenance or software errors, missed deadlines or responsibilities expired, accounting errors, loss of collateral damage delivery management), monitoring and poor reporting (errors in reporting requirements, inaccurate reports), inconsistent information to customers, record erroneous input data (the client without permission, the lack of documents or incomplete documents), customer account management (administration pledged defective, unauthorized access to the accounts , records the wrong customers, generating gross negligence or endanger the loss of client assets), commercial parties (nonperformance in customer contracts, contractual discussions between customers, poor performance of third parties involved in transactions, suppliers and manufacturers with which financial institution is Related (Outsourcing of banking activities, discussions between producers), deviation from the standards can lead to risks arising from changes in law or applicable standards, external fraud.

- Employment Practices and Workplace Safety are losses arising due to actions contrary to the laws and conventions in terms of employment, health and safety at work, where we can mention: the employment relationship (staff compensation claims, labor organization and activities); safe working environment (non-labor protection rules, omissions, rewarding workers) Diversity and discrimination (discriminatory promotion policies).

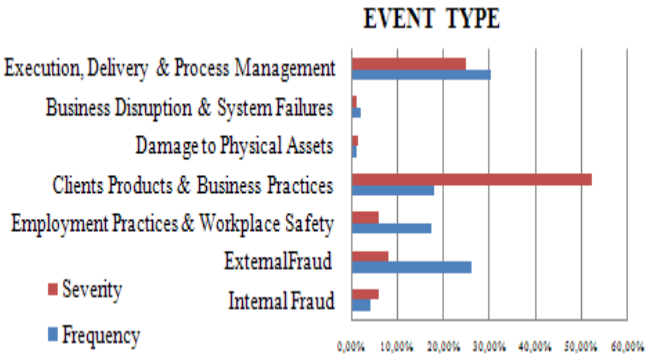

Fig. 7: DISTRIBUTION OF LOSS AMOUNT AND NUMBER OF LOSS BY EVENT TYPE

Taking into account the analysis shown in Fig. 7, in terms of severity of loss the leader is class customers, products and business practices. Other losses experienced by institutions were: non-compliant products, negligence and lack of adequate training, unprofessional because more than half of bank employees are students, violating trust and norms of conduct towards customers, because staff did not resist to "blackmail" customer's, improper use of confidential information, aggressive sales strategies, such as issuing credit cards without notice customers, exceeding the aggregate exposure limits on client needs analysis of clients so wrong. In terms of number of losses, first class ranks execution. Than we have the process of management. The losses recorded were: partial or total lack of legal documents, communications erroneous failure of models or systems, loss or damage created due to customer negligence, breach deadlines of reporting obligations or duties, introducing errors, operating, storing or updating data, negligence in maintaining databases, etc. failed deliveries. Also noted in Fig. 7, relatively low weight, both in terms of number of casualties and in terms of their value, are losses due to internal fraud and employment practices and workplace safety that might explain through effective management developed by financial institutions participating in this exercise.

Bank's activities are grouped according to the New Basel Accord in eight standard business lines: Trading and Sales, Agency Services, Retail brokerage, Payments and settlement, Commercial Banking, Retail Banking, Asset management, Corporate Finance.

Principles for business line are as follows:

• All activities must be mapped into the eight lines, respecting the exclusive mapping of an activity to a single line;

• Any activity which can not be easily mapped on a given line, but is in fact related to a business transaction framework, must be allocated to a line of activity. If an ancillary operation supports multiple business lines of credit institution must establish and use an objective criterion for employment;

• If an activity can not be mapped into a given line, the work will be included in the line yielding the largest share of operational risk. On the same line of business and related operations will be assigned to the respective activity;

• Credit institutions may use internal methods for allocating the relevant indicator of business lines. Costs that are generated in one business line which are imputable to a different business line may be reallocated to activities that are in line, for example, using a treatment based on internal transfer costs between the two lines of business;

• The business lines for purposes of determining the capital requirement for operational risk must be consistent with the categories used for credit and market risk;

• Senior management, under the supervision of the Management Board is responsible for framing policy for the mapping. This policy is subject to Board approval of the credit institution;

• The mapping to business lines must be periodically subject to independent examination.

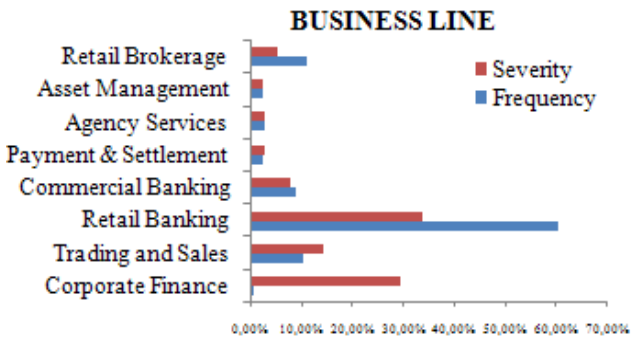

Fig. 8: DISTIBUTION OF LOSS AMOUNT AND NUMBER OF LOSS BY BUSINESS LINE

Analyzing Fig. 8 it might be seen that the riskier lines of

business are commercial and retail banking, reflecting the fact that they are the main lines of business for most credit institutions. Losses are mainly due to trading and processing errors that may occur in banking activities, explained by: error occurred when opening customer accounts, such as incorrect data entry system, incomplete documentation, lack of signatures, incorrect classification customer, etc. Cashier errors in activity include: un-discharged customer signature, issuing non-compliant documents for exchange, etc. Regarding the errors occurring at the time of payment we can mention: unauthorized payment, late payments, incorrect choice of currency at the time of payment, delay transmission of payment orders, the same transmission of multiple orders, erroneous data entered in system, lost checks, debit clearing false instruments etc. The errors occurring in the exchange rate: failure rate regulation, misunderstanding the meaning of exchange, etc.., IT error: error transferring data, etc. systems malfunction, fraud arising lending process: acceptance of incomplete records, falsifying information, the use of identity documents so fake.; errors in making the attachment, such results are: delays in notifications, locking, unlocking unauthorized accounts, violation of regulations and internal rules, etc.., errors in administration of claims, such as acquisition or late reporting by departments approved late submission of complaints, etc. responses. In terms of severity corporate finance business lines can highlight the severity of losses occurred in recent years and also that credit institutions have developed increasingly more data collection process.

The present value of the optimal level of capitalization of financial institutions is particularly important to allow capital to meet the operational function of protection, which involves the absorption of losses for any contingency that may arise during the conduct of business which will allow a reduction the probability that bank insolvency and default increase the degree of confidence of the population in the domestic banking system.

To obtain high values for a particular business line gross income reveals the size and intensity of activity of the institution concerned on those industries, also providing information about the departments concerned with potential losses that may occur and the amount necessary to cover losses related to operational risk business lines.

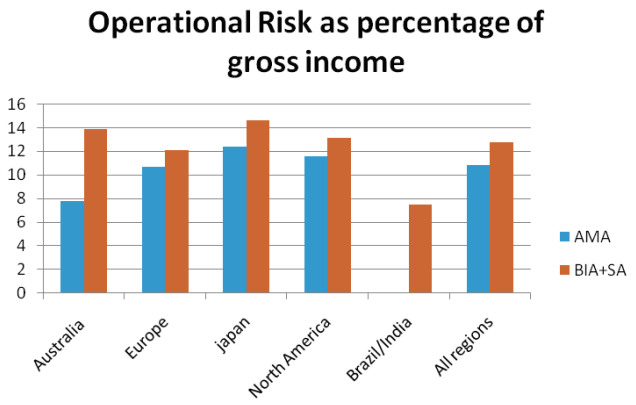

Fig. 9: OPERATIONAL RISK AS PERCENTAGE OF GROSS INCOME

As seen in Fig. 9 for operational risk capital share in gross income for institutions applying advanced methods is much smaller than those that apply the basic indicator approach or standardized method. The financial institutions mobilized a much smaller capital because they can identify measure and manage operational risks more effectively being able to discover what business lines operational risk manifests itself more and who are the most important risk factors. In the literature, it is considered that the capital requirements for operational risk are reduced by using a more advanced approach illustrated by Fig. 9.

The standard approach as also as the basic indicator approach does not take into account the differences between markets in different countries and the specifics of each institution's internal process.

From the practical experience of some institutions such as Barings and AIB case is easily seen that using gross income as a measure of operational risk is not satisfactory behavior due to fraudulent and unethical staff. Thus the assumption of a linear relationship between these two indicators give false incentives, that an institution will encourage them to increase the level of risk to maintain the desired breakeven.

III. PROBLEM SOLUTIONS

Data quality varies from one institution to another, so that many banks still have an internal database that includes past events relating to operating loss, or whether a data have included frequent and less severe or very large losses. Data must be carefully selected to reflect the institution's business. Understanding the structure and characteristics of the data is an important step in the modeling process as recently demonstrated that the severity distribution of operational loss distributions is private.

Challenges and characteristics of the data are as follows:

- From one institution to another quality of data varies;
- Thresholds above which data are reported are different from one institution to another;
- Amount of loss is approximated;

- measure the validity of time series;
- Loss of time accuracy depends on the brand;
- Loss is characterized by irregularity reporting.

Characteristic data on operational losses can mention that they have a heavy-tailed severity [6], the right-skewness and high kurtosis site. Data are collected over a certain threshold ($ 5,000 or $ 10,000) because:

- Loss of observed values is less than the management of the institution;
- It is a costly process;
- Data characterized by a high severity may lead to an estimate cost of capital, while failure to report frequent losses can lead to its underestimation;
- Recording the very small losses, but very numerous recording errors can occur and thus create new operational losses.

Chernobai, Menn, Truck and Rachev [5] showed that if not done an adequate crop data given that the losses and frequencies that are independent and follow identical distributions, capital for operational risk is underestimated.

There are a variety of methods to estimate the severity of losses since idiosyncratic feature of the assumptions made for a particular business line or type of financial institution, so it is not desirable to establish a severity distribution for operational risk modeling.

Over time, after applying the basic indicator approach and standardized methods in practice, it was found that between the capital and operational risk can not be disputed a report and found in some cases is that the limit is expensive if excessive capital which will lead to failure rate of return and there are some situations where this is insufficient, insufficient capital case in which the institution sets credit risk, where financial institutions are exposed to significant risks, because not accurately determine the operational risk losses. Capital increase does not necessarily mean a credit institution's health, whose survival depends on the profitability performance of the business, not an anticipated risk management and preventive control of operational risk events.

Thus many analysts believe that the two methods for determining operational risk capital requirement related, basic and standard method, is insufficient given that institutions can demonstrate their use are key risk factors facing the while operational risk and unable to build an appropriate risk culture.

Advanced approach presents several advantages among which we mention the following:

- Potential for reduced capital allocation;
- Competitive advantages in price risk assessment;
- Cost savings due to reduction in economic capital allocation;
- Reduction of operational losses through effective monitoring;
- Introduction of mechanisms for prevention;
- Focus on the rehabilitation of critical processes;
- The establishment of international standards at potential Sarbanes-Oxley.

A sensitive method for measuring operational risk capital requirements aims to determine the actual loss potential based on a probability of each line of business across the banks, such as:

- Risk assessment based on existing knowledge of a correlation between it and an indicator for the Basic Indicator Approach, Standardized Approach and the Internal Assessment Approach;
- Risk assessment based on a distribution of loss, if the Loss Distribution Approach;
- Risk measurement scenarios based on self-assessments by experts.

Because applications of these methods to quantify operational risk have been found and a number of issues, such as:

a. a series of tensions arise because of identifying the level of operational losses, such as: obtaining different values for indicators because accounting standards and practices vary from one country to another, of Lack of regulations on the inclusion or exclusion of components losses in the required capital base, the allocation of losses to various categories of risk is difficult.

b. Consistency, relevance and bias estimates depends on the frequency and impact of loss events as long as quantitative methods are applied on irrelevant data, poor quality or too expensive.

c. With no regulations in the field VAR method is applied with difficulty to identify because of structural dependence that exist between risks, estimation, and testing procedures used to calculate an increased number of functions.

IV. CONCLUSION

Aim of the study was to highlight the implementation of operational risk issues to promote consistency and spread them over to the authorities, and may even provide an opportunity for financial institutions to better understand and practice their aces to develop a framework for operational risk.

Thus we suggest that the first step to financial institutions should make for measuring operational risk is to conduct an inventory by category and creating methodologies to identify, plan and avoid these risks, and devising plans for crisis and address the effect of event risk.

By using advanced methods, credit institutions may identify operations as challenging operating loss and can show progress in the management procedures of this type of risk. But to use such methods, the supervisory authority must demonstrate that the database has complete and well documented, and in some cases must also have additional funds to be able to invest significant sums of money in a process operational risk management.

The new agreement is likely to establish some kind of financial and economic discrimination between large banks (which have sufficient funds to design and implement comprehensive and effective internal models for risk assessment) and smaller, which in turn is reflected on structure of national banking systems by increasing bank concentration (encourage acquisitions and mergers in the banking plan) with all the complex factors that lead to this phenomenon it, namely:

reducing the level of competitiveness by large banks and the establishment of monopoly positions regarding the imposition of banking prices.

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