BANK RISK MANAGEMENT

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Abstract

Banking risks are phenomena that occur, more or less, in unforeseen or predictable situations. Controlling and preventing the effects of bank risks is based on rigorous management in the banking system. Knowing bank risks involves activities and involves going through several stages.

The first is that it is necessary to know and forecast the banking risk. The second is the identification of bank risk, which depends on the diversity of business lines and banking products / services offered to customers.

Furthermore, the quantitative and qualitative risk analysis involves the use of techniques and tools, but above all the skills of workers studying the risks, analyzes their effects and thus provides for measures accordingly.

Establishing risk strategies is a very important issue that aims to minimize risk-related expenses but at the same time requires banking supervision to avoid supervision and monitoring of the National Bank. The authors point out that the National Bank plays a decisive role in establishing and analyzing the banking system.

Last but not least, risk monitoring and control means that once identified these risks must be monitored and, as far as possible, the necessary measures are taken to ensure that they are rigorously controlled.

It is necessary, and the authors have dealt with the setting of risk management models, identifying two methods (models) for banking risk management. Thus, three authors, Williams, Smith and Young, consider that for risk management is an equally important, if not the most important component, and it is stated that risk management is an organizational level that must be well established, known and applied . Then, Glyn Holton believes that risk management must be part of the organizational culture of management. The authors focus on quantitative risk analysis using modeling problems, from risk modeling to the Monte Carlo simulation method. Analysis based on the decision tree is one of the aspects to which the authors have

attached them and, schematically, show that these are tools that describe the key interactions between decisions and the random elements as perceived by the decision-makers.

An interesting approach is made to the Monte Carlo simulation method that addresses input variables, defining the distributions of „random variables", analyzing output variables, applying simulation, and ultimately applying analysis and interpretation of simulation results.

Keywords: *risk, risk management, quantitative risk analysis, risk modeling, Monte Carlo simulation*

JEL Classification: *C50, G32*

Introduction

This article builds on the notion of risk and then analyzes the stages of banking risk management, highlighting the three points considered as working steps, such as: risk planning, banking risk identification, quantitative and qualitative risk analysis , establishing the risk approach strategy and then monitoring and controlling the risk. All stages of work are essential elements to be considered in the analysis and establishment of the banking strategy used.

Next, there is a presentation of the main risk management models, with emphasis on Williams, Smith or Young's theories, which consider that risk managers may be more important than other strategy points for business managers, including bankers, and need to be approached at the level organizations.

Glyn Holton's point of view is then presented, and then the quantitative risk analysis is presented, with emphasis on risk modeling, the analysis of the beneficiary's rate so as to reach the analysis of the decision tree and finally the simulation of the data identified using the Monte Carlo method.

The authors point out that Monte Carlo simulation is used to study the behavior of random variables. The objective of the simulation is to evaluate the behavior and performance of critical variables of risk decision making. Depending on these, the decision to accept or reject the action of the risk factor will be taken, but most often measures for monitoring the risk are foreseen, there are possibilities for measuring the risk factor, and, as a consequence, the undertaking of measures precise to eliminate as far as possible the effects of the risk.

Applying Monte Carlo's approach to banking risk simulation, we can identify five important steps, namely: identifying input variables, random variable distribution, identifying output variables to simulate the behavior of variables using specialized simulation programs. Finally, following these steps, we analyze and interpret the simulation results that the authors present as endpoint in a banking risk analysis model.

Literature review

Aizenman (2010) believes that the need for foreign debt management policy in emerging markets is imposed in situations of financial crisis. Ly (2015) investigates the correlations between banks' liquidity risk, regulation, supervision and performance by conducting a study on the EU27. Ippolito et al. (2016) show that by providing liquidity to depositors and borrowers, banks may be exposed to the double circulation of assets and liabilities. Anghel and Dumitrescu (2016) outline the consequences of liquidity risk, as well as the methods used in its management, namely the management of bank liabilities, assets and cross-management techniques. Anghelache, Anghel and Bodo (2017) started from the phrase „information is power" and presented the particular role of information in the decision-making process, emphasizing the main objective of modeling, namely to maximize benefits. Anghelache and Bodo (2016) studied the context in which a risk can be considered to have the level of systemic risk and what are the main internal or external factors that determine this situation. Anghelache, Anghel et al (2016) pointed out that the understanding of economic behavior confronted with risk can be achieved through modeling. Anghelache and Anghel (2014) are a reference work in the field of economic modeling. Anghelache (2010) conducted a theoretical and practical analysis of the main methods and models for quantifying financial and banking risks. Levratto and Tessier (2016) conducted an empirical analysis of the French business performance market. Mundy and Bryant (2015) analyzed the defining elements of SME access to intermediate credits. Wehinger (2013) presented a review of the literature on SMEs' difficulties in accessing finance during the crisis amid a sharp decline in bank profitability and bank erosion that negatively affected lending.

Research methodology, data, results and discussions

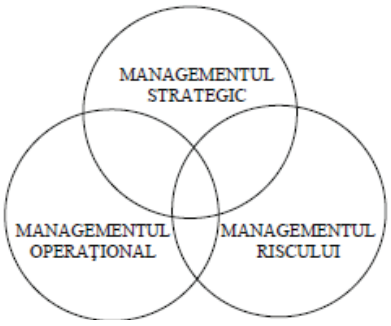
Banking risk management is a cyclical process that takes place throughout the course of a project or activity and involves five stages of work, namely:

- Risk management that relates to management awareness of the need for risk management process and the creation of the organizational framework through which this activity is carried out.
- Identifying bank risks that depend on the diversity of business lines and banking products / services offered to clients, and includes processes that identify the main risk factors, their interdependence (a particular exposure that may cause several types of risk) and materialize in developing the risk profile.

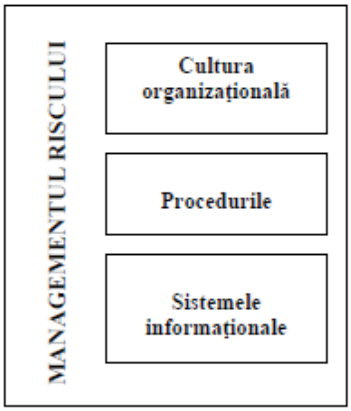
- Quantitative and qualitative risk analysis involves the use of the techniques, tools and abilities needed to quantify the risks identified previously. The development of quantitative modeling tools based on statistical data allow the realization of simulations that are useful in analyzing the effects of risk factors on the bank's risk profile and its impact on profitability.
- Establishment of risk approach strategies aims at minimizing the risk associated with the risks associated with all exposures that have been identified and quantified (by domain-specific methods and techniques). At the same time, risk monitoring must be within the prudential limits imposed by the Supervisory Authority (NBR). It may, when it is anticipated that events occurring with a negative impact on the bank or the entire financial system are anticipated, to specifically monitor the exposures of a bank.
- Risk monitoring and control consists of measuring the performance of risk exposure coverage (risk-performance couples) and offers the possibility of optimizing / adjusting future policies based on identified weaknesses and weaknesses.

Instruments, techniques, or procedures used to manage bank risks are not universal and are not standardized, practice demonstrating that they are specific to each bank, but at the same time are in continuous development and improvement, it is not substitutable.

• **Risk management models,** in fact, reflect different views on the role and place of risk management within the enterprise, as well as identifying the elements that a risk management strategy should contain at an organizational level. The two models studied in more detail are described below. Williams, Smith, and Young - believes that risk management for a company's managers is just as important as strategic management and operational management.



Glyn Holton believes that risk management must be part of the company's organizational culture, and must be included in its procedures and that information systems must provide the logistical support needed to support it.



• **Quantitative risk analysis** refers to the determination of the impact level of a risk event. If the risk analyst can not give an exact probability of such an event, he can instead calculate the amount of losses or depreciations generated. In this respect, risk management has developed a number of calculation methods and techniques that help analysts determine the magnitude of the impact of a risk event. Among these methods we distinguish: risk modeling; analyzing the expected value; benefit-cost analysis; analysis based on the decision tree; the Monte Carlo simulation method.

• **Risk modeling**

• **In risk management**, simulations are summed up to test real-life risk models using the most varied tools ranging from banal tables to advanced mathematical calculations. Regardless of the instrument used, risk modeling allows the analyst to examine the consequences of a risk event by simulating it under realistic conditions. For example, a project budget is made in several variants according to the expected expectations: optimistic - realistic - pessimistic. Or, the effect of risk factors on the final product can be quantified, each element taken into account, resulting in additional costs, delays, deviations, etc. Another risk modeling method, namely the PERT / CPM Diagram method, is encountered in risk management. The name of this method derives from Program Evaluation and Review Tehnique and Critical Path Method.

• **Analyze the expected value**

The simplest method for quantifying risks is that of the expected (VA) expected value (VA), which is calculated as a product between the probabilities of occurrence of certain events and their effects.

This method involves three stages: establishing the likelihood of risk; determining the impact on the activity; calculating the expected value.

$$VA_a = P_a * E_a ,$$

where:

VA_a = expected value of event *a*;

P_a = probability of event *a*;

E_a = the effect of the phenomenon *a*.

• **Benefit-cost analysis**

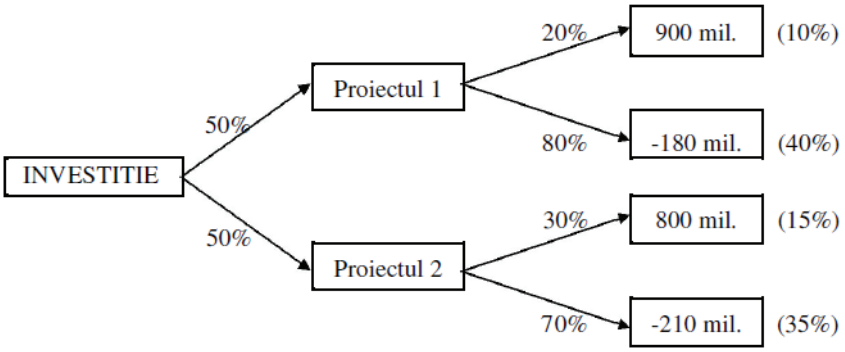
In their work, economics and finance specialists have attempted with the benefit-cost ratio (RBC) to determine optimal financial policies that generate maximum profits. These analyzes help managers to determine how the benefits vary across different economic environments. Cost-benefit analysis is often used in investment decisions, including the choice of an investment project, but also the quantification of the impact that a particular event may generate on the project or investment, that is, in the quantitative risk analysis. The calculation relation is as follows:

$$R_{bc} = \frac{Benefit}{Cost}$$

This indicator shows the profit obtained for an invested monetary unit. There are several budget variants, each taking into account certain risk factors and quantifying their effects.

• **Analysis based on the decision tree**

Decision trees are tools that describe key interactions between decisions and random events as perceived by decision makers. Tree branches are either decisions or random or uncertain results, following the following two rules: the probabilities of each branch and subram is multiplied; the sum of probabilities associated with a node is equal to 100%.



• The Monte Carlo simulation method

Monte Carlo simulation is used to study the behavior of random variables. The purpose of the simulation: to evaluate the behavior and performance of critical variables in risk decision-making. Depending on these, the decision will be taken to accept or reject the risk factor action. A Monte Carlo simulation approach involves: identifying input variables; defining distributions of random variables; defining output variables (outputs) that we are interested in; simulating the behavior of the output variables by means of a specialized simulation program; analysis and interpretation of simulation results.

Conclusion

It follows from the above that in the activity of any banking institution it is necessary to foresee a certain mode of activity, procedure, which is synthesized in a model aiming at avoiding the risks, knowledge and mitigation of their effects and finally , making an option, a decision that is in line with the bank's profitability objective. From the analysis, the authors identified some methods (models) that can be used in banking risk analysis.

Risk management is an integral part of the bank's strategy to optimize the risk-performance couple, and responds to the vulnerabilities and complexities of the business environment in which the bank operates. In the banking system in Romania, it is accepted that risk is an essential component of the bank's profile and, consequently, the further development of the banking strategy will only be achieved if the current and prospective risk profile is carefully monitored and updated at all times. Specialist literature deals with risk management from the perspective of developed financial and banking markets, able to provide the valves necessary to restore the balance in the event of adverse effects that the risks may generate. The characteristics of the Romanian economy require both the adaptation of the practices and concepts

used in the world, as well as the application of specific methods of the internal financial-banking system.

The conclusions that come out are of a theoretical nature, in the sense that some models are available for analyzing and preventing bank risk. These models can simulate concrete data from any bank using econometric analysis models.

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