## IMPROVING BANK RISK MANAGEMENT IN THE CREDITING PROCESS BY IMPLEMENTING THE FICO CREDIT SCORING MODEL IN EFFECTIVE COMBINATION WITH THE CREDIT HISTORY BUREAU

#### PhD student Leonid BEJENARI, ASEM

According to the changes made in the regulatory framework, established by the Basel Committee on Banking Supervision, banks have to improve their credit rating systems. Under these circumstances, one of the solutions to banking success in customer lending becomes the possibility of automating the decision making process. An optimal solution to this is the credit-scoring model.

Key words: banking risks, risk management, FICO credit scoring model, Credit History Bureau, crediting process

JEL: G21 - Banks; Other Depository Institutions; Micro Finance Institutions; Mortgages

#### Introduction

The topicality of the risk management issue in the banking sector has grown considerably at the end of the 20th century. During this period, due to the high interest rate diversity, generated by the accentuated inflation and the energy crisis, due to the significant fluctuations in currency exchange rates following the abolition of the Bretton Woods system, and due to tighter competition on the capital market, instability becomes a characteristic feature of the environment wherein the financial institutions operate. Under these circumstances, banks' vulnerability has increased and the number of bank bankruptcies has risen [2]. At present, risks have become characteristic of the banking activity, generating several approaches to this concept. The purpose of the research is to analyse the concept of banking risk and the particularities of credit risk management in commercial banks, as well as the possibilities offered by the FICO credit scoring model for streamlining the banking risk management in the lending activity.

## Analysis of bibliographic sources in the area of researched matter

In the area of credit risk management in commercial banks there are many researches elaborated at national and international levels. The researches on improving the management of credit relations of commercial banks in order to reduce the risks have been reflected by Gîrlea M. in the doctor's thesis. The methods of credit risk assessment and management in commercial banks have been presented in more detail by Perciun R. in published materials. Similarly, during the research international sources of modern credit risk mitigation methods, namely the FICO scoring method, have also been consulted.

# **Research methodology**

A complex and systemic methodological approach was applied in the research, which facilitated the harmonization of the theoretical arguments with the practical application of the proposed approach. The fact that the researched phenomenon has an impact on the banking and financial system, the applied research methodology is based on the general principles of the complex system analysis: systemic analysis method, data analysis methods, international scenarios and comparisons method. These specific methods followed the established consecrated methods: scientific abstraction, analysis and synthesis, induction and deduction, observation, reasoning, comparison and grouping.

### **Results obtained**

The crediting risk approach, developed in accordance with the basic principles laid down in the Basel II agreement, provides for the following terms:

• The risk is the uncertainty state faced by the bank with regard to the probability of obtaining a certain financial result. Taking into account the specificity of financial institutions' activity and the high requirements for banks' financial stability, this state is being determined by the magnitude of unexpected losses with 99% confidence.

- Credit risk represents the possibility of loss arising as the result of the credit beneficiary's inability to meet the contractual commitments.
- The probability of default is the possibility that the credit beneficiary will go bankrupt, become insolvent, or will not be able to pay the liabilities within a certain period.
- Exposure to risk at the time of default is the assessment of the cost of the balance sheet positions of the credit beneficiary exposed to risk at the time of the default, without taking into account the sources of insurance. For relatively simple financial instruments (simple loans, ordinary bonds), the exposure to risk is constant and equal to their nominal cost.
- The size of loss in the case of default is the loss in the case of non-repayment of the loan, which is equal to the bank's exposure to risk at the time of inability to pay without the recoverable amount of money, adding the additional expenses related to the recovery of the loan.
- The economic capital inherent in credit risk is the weight of the share capital, which must be reserved to cover potential maximum losses that are inherent to the lending activity with 99% probability. The size of this capital is the estimate of the credit risk assumed by the bank [2].

In conformity with amendments made to the regulatory framework set by the Basel Committee on Banking Supervision, banks are required to improve their credit rating systems. The totality of banking risks should be accompanied by information on the quality of these risks. This gives a complete picture of the risks that the credit activity generates [3].

Ratings are scores that quantify the risk due to losses in the event of a debtor's inability to pay and the extent of recovery of such losses. Most rating systems contain between six and ten different ranks that are sufficient to complete a classification depending on the risk [6].

Currently, the independent ratings agencies that use quantitative and qualitative methods to determine the strengths of a bank, dominating the global market are the following:

- Standard & Poor's Ratings Group;
- Moody's Investors Service;
- Fitch-IBCA.

In the vast majority of cases, the credit rating agencies measure the quality of the risk for the contracted debt and not the debtor's financial situation. The reason is that debtors may have debts with different degrees of risk, and investors are more interested in the risk pertaining to the debts contracted by a borrower and less in his/her financial situation [6].

Under these circumstances, one of the solutions to bank success in customer lending becomes the possibility of automating the decision-making process (processing of applications, analysis of the financial situation and making the decision itself) by minimizing the participation and influence of the human factor in making this decision. An optimal solution to this is the credit-scoring model.

The **credit-scoring model** is a mathematical or statistical model, with the help of which, and based on the credit history of previous customers, the bank attempts to determine the likelihood that the potential debtor will pay off the liabilities fully and in due time. In a simplified view, the scoring model represents a totalizing sum of the values attributed to some predetermined characteristics of the debtor (level of financial indicators, experience in activity, statement of accounts, reported history, existence of other loans, data of last payments, unpaid amounts, area of activity etc.). Finally, a comprehensive result (score) is obtained, which represents a customer delimitation threshold (good or bad) [7].

In commercial banks, this credit-scoring model is used for both for individuals and legal entities. According to these scoring models, the financial performance is assessed by each bank and, depending on the borrower's total accumulated score; the economic operators will be included in one of the following categories:

"Category A" – companies in this class of risk have the highest financial standing. Such clients have no problems in providing strong collateral (counter-guarantees) in order to obtain a possible bank loan. There are no irregularities in payment terms for the company's suppliers, and, with these companies, there is low likelihood that any loss will incur. Present and future performance is very good, which at the same time ensures the repayment of loans by maturity.

"Category B" – companies in this risk class have a very good financial standing and are able to offer strong collateral (counter-guarantees). As regards payments to suppliers, this flows normally; is not impossible that some minor issues related to this aspect might arise, but these could be solved very easily and with minimal financial effort. At the same time, the present performances are good and very good, however with a degree of uncertainty for a longer perspective.

"Category C" – Companies in this risk class have a fairly good financial standing, but there may be problems related to receipts. In turn, these lead to irregularities in the supplier's payment schedule, but can be resolved without recourse to rescheduling or postponement of the due dates. Such companies may have problems with the provision of strong collaterals and counter-guarantees and no losses are expected that would cause problems for the company. The performances are satisfactory, but posting an obvious worsening trend.

"Category D" – companies in this risk class have serious problems with the receipts from beneficiaries, which leads, similarly to companies in III Group, to financial bottlenecks resulting from the inability to pay by the deadline set by the suppliers, but is resolved by implementation of a new payment schedule (rescheduling). These companies bear losses; thereby they are exposed to relegation to the lower risk class.

**"Category E"** – this class includes companies that have serious cash flow problems. The likelihood of irregularities in payments is very high, and this situation is usually resolved by means of rescheduling or interest charges. With small exceptions, all companies in this class have great problems in providing strong security, but also have poor performances that foreshadow a state of insolvency [3].

In European countries, the possibility of reducing the non-performing loans is underpinned by the presence of the *credit history bureaus* (CHBs), which submit to the banking system a vast and varied volume of information about the credit history of each client.

In the Republic of Moldova, there is the Law No. 122-XVI on credit history offices [1] in force, which aims at creating the conditions for the formation, processing, storage and presentation by credit history bureaus of the information that characterizes the compliance by the borrowers with the commitments made through credit agreements.

Establishing credit history bureaus and implementing a scoring model would be a priority prerequisite to promoting mass lending. For these reasons, at the initial stage, banks could minimize the risks of mass lending only by applying to crediting qualitative and efficient statistical and mathematical models. Credit history is the file on a natural person or legal entity, which includes information about paid accounts, repaid loans, observed contract obligations and other financial events in borrower's life. In most countries of the world, creditors exchange information on the solvency of their clients through their credit history bureaus (hereinafter referred to as CHB).

World experience shows that CHB activity entails a number of advantages:

- □ *firstly*, they reduce the obstacles to financing by raising banks' level of information about potential borrowers, enabling a more accurate loan repayments forecast.
- □ *secondly*, in most banks using credit histories, the processing time and the costs required to issue a credit have significantly reduced, as well as the volume of non-payments; consequently, bureaus contribute to lower interest rates on loans.
- □ *thirdly*, they form the so-called disciplinary mechanism for borrowers. Everyone is informed that in the case of failure to fulfil the obligations, their reputation before potential creditors will dissipate instantly, entailing therefore isolation thereof from lending or higher borrowing costs. This mechanism stimulates the debtor to meet the obligations, reducing the risk of unconscientious behaviour.

It is worth mentioning that the countries wherein the Credit History Bureaus operate enjoy a higher degree of creditor security and lower credit risks.

As a way of improving the risk management in the credit process, it is proposed to use the Fico creditscoring model in effective combination with the Credit History Bureau. This method is a qualifying indicator that assesses the probability that the borrower will pay off the loan and the interest rates at maturity date. By applying this method, each customer is assigned a score ranging between 300 (weak) and 850 (very good).

The FICO Score method expresses the likelihood that a customer will repay the credit. Higher the score, greater is the likelihood of repaying the credit at maturity. Designed to be used irrespective of the particularity of the Credit Bureau or country in which this institution operates, the FICO Score is an international standard, a universal tool for credit risk management with regard to individuals [5].

FICO is a software company based in San Jose, California, founded by the engineer Bill Fair and the mathematician Earl Isaac in 1956. Its FICO score, which is a tool assessing the credit risk, has become an accessory of consumer credit in the United States and other countries. FICO went public in 1986 when it was first involved in New York Stock Exchange transactions.

The method proposed by *Fair Isaac* is based on the scoring model, which allows its swift implementation in any country that has a Credit Bureau.

According to the information provided by the company that developed and perfected this system (*Fair Isaac Corporation*), the FICO score is calculated based on to 5 criteria:

- payment history (which has a weight of 35% or a maximum of 297.5 points in the final score);
- amount owed, i.e. existing credits (30% or maximum 255 points);
- length of history (15% or maximum 127.5 points);
- new credits (10% or maximum 85 points);
- types of credits used (10% or maximum 85 points) [8].

The weight of each criterion differs for different customers, that is, for those who have not requested credit for a very long time, the importance of the criteria is slightly altered.

1. The criterion "Payment history" focuses on following information:

- $\Box$  repayments of loans in the past;
- $\Box$  maximum number of days of delay, if there were arrears;
- $\Box$  outstanding amounts;
- $\Box$  time passed since the arrears arose;
- $\Box$  number of arrears;
- $\Box$  number of loans repaid without delays
- 2. "Amount owed" criterion is assessed by means of:
  - □ balance of existing credits, by type of loan (credit card, personal expenses loan, mortgage loan, etc.);
  - $\Box$  number of credits;
  - □ share of credit in the total credit line approved by the bank in the case of overdraft and credit cards.
- 3. "Length of history" criterion uses:
  - $\Box$  time passed since the accounts were opened;
  - $\Box$  time passed since there has been no activity recorded in the accounts
- 4. "New Credits" criterion focuses on:
  - $\Box$  number of accounts that have recently been opened and their type;
  - $\Box$  number of records at the credit bureau;
  - $\Box$  time passed since the last account was opened;
  - $\Box$  time passed since the last recording;
  - □ restoring a positive payment history, following the disappearance of past issues
- 5. "Credit type used" criterion analyses:
  - □ number of customer's active accounts, diversified by product types, number of customer's active accounts, diversified by product types [5].

The FICO score method is based on the aforementioned criteria, so that the ultimate result, the final "grade" does not depend only on one criterion. At the same time, the importance of each criterion has a direct dependence on information reflected in the Credit History Bureau, information that configures data about the customer. As the data is changed, the client moves on to another category, so it is impossible to determine pre-emptively on individual level how much each criterion accounts for. This can be seen as an opportune aspect because it reflects the real situation of the client.

This score takes into account both positive and negative information. Arrears with credit reflected in the past reduce the score for a client, but as the interest and the credit are paid on time in the following period, this aspect will be taken into account and FICO score will improve.

Fair Isaac has collaborative relationships with credit bureaus from other countries outside the United States, namely: Russia, Korea, Ireland, Bahrain, Great Britain, South Africa, Brazil, Singapore and Canada. In European countries and the Orient, the FICO Score was implemented in Poland, Sweden, Saudi Arabia and Turkey. In Asian countries, the FICO Score is used in Thailand and Taiwan, as well in countries in Latin America (Brazil, Mexico, Peru and Panama) to improve risk management. Currently, the FICO score is also being analysed by banking and financial institutions in other countries.

The FICO score will help the banks of the Republic of Moldova with assessment of the credit risk, substantiation of the lending decision, and as a result it will reduce the credit risk. At the same time, the FICO score, being combined with the Credit History Bureau's database, will help the participants obtain veridical information from the database, which is characterized by increased predictive value, by combining the score obtained with the information presented by the customer in the credit application and internal evaluation used by credit officers. The banks will be able to measure the credit risk peculiar to individuals with a very high degree of accuracy. This method of credit risk analysis and assessment will allow them to

match their credit offers to the type of the risk pertaining to a client and thus increase the degree of financial market monitoring in an informed, controlled and flexible manner.

# Conclusions

In broad terms, the FICO score method applies scoring technology to credit risks and places credit applicants according to their past financial behaviour, i.e. based on the payment history with regard to both interest and credit principal, which largely reflects the risk level for the bank when providing credits to this customer.

Thus, higher the score and the points are, more attractive is the respective applicant for the bank, or lower the risk higher the chances for the applicant to get a loan. Depending on this qualifying rating and based on the data presented in the credit application, and additionally where appropriate, by using the internal rating, commercial banks can get a wider picture of the applicant's capacity to pay and come to the right decision whether to offer or not the credit [5].

Using the scoring model (FICO score) to make decisions on lending will allow commercial banks accelerate the process of processing credit and loan applications, reduce bank staff, reduce administrative costs as a result of job cuts, making prompt analyses, and making optimal decisions in the credit process.

### **Bibliographical references:**

- 1. Law of the Republic of Moldova on credit history bureaus no.122-XVI of 29.05.2008, OG no. 138-139 of 29.07.2008
- 2. Basno C., Dardac N., Bank management, Economic publishing house, București, 2002
- 3. Gîrlea M., Improving the management of commercial banks' credit relationships with clients in order to reduce bank risks. PhD in economics thesis, Chişinău, 2012
- 4. Nemeroff E., "New FICO Scoring Model Coming This Summer". National Mortgage News. Retrieved 21 October 2014.
- 5. Perciun R., Ghîrlea M. Methods of credit risk assessment and management in commercial banks. In Annals of the Institute of Economics, Finance and Statistics. II Edition, Chişinău 2012, p.94
- 6. Bank for International Settlements "Risk Management Guidelines for Derivates" Basel Committee on Banking Supervision, Basel, 1994., http://www.bri.org/about/history.htm
- 7. www.bankrate.com/calculators/credit-score-ficocalculator.aspx&prev=/search%3Fq%3Dfico% 2Bscore%2Bmodel%26hl%3Dro%26lr%3D&rurl=translate.google.com&usg=ALkJrhht1wog52arWi E53HF1H8kHhC8E0A
- 8. http://www.myfico.com/consumer-division-of-fico.aspx