

Development of Credit Risk Management System for Non-Bank Credit Organizations

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Abstract— The management of risk data and information is key to the success of any risk management effort regardless of an organization's size or industry sector. Risk management information systems/services (RMIS) are used to support expert advice. One of the most important risks that need to manage is credit risk. This work is about developing the credit risk management system. System should define risks at credit approval level and monitoring interest/principal repayments.

Keywords— RMIS; credit organizations; Bank; risk

I. INTRODUCTION

While financial institutions have faced difficulties over the years for a multitude of reasons, the major cause of serious banking problems continues to be directly related to lax credit standards for borrowers, poor portfolio risk management, or a lack of attention to changes in economic or other circumstances that can lead to a deterioration in the credit standing of a bank's borrowers. Credit risk is most simply defined as the potential that a bank borrower will fail to meet its obligations in accordance with agreed terms. The goal of credit risk management is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters [1]. Banks need to manage the credit risk inherent in the entire portfolio as well as the risk in individual credits or transactions. Banks should also consider the relationships between credit risk and other risks. The effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization [2].

For most banks, loans are the largest and most obvious source of credit risk; however, other sources of credit risk exist throughout the activities of a bank, including in the banking book and in the trading book, and both on and off the balance sheet. Banks are increasingly facing credit risk (or counterparty risk) in various financial instruments other than loans, including acceptances, interbank transactions, trade financing, foreign exchange transactions, financial futures, swaps, bonds, equities, options, and in the extension of commitments and guarantees, and the settlement of transactions.

Since exposure to credit risk continues to be the leading source of problems in banks world-wide, banks and their supervisors should be able to draw useful lessons from past experiences. Banks should now have a keen awareness of the need to identify, measure, monitor and control credit risk as well as to determine that they hold adequate capital against

these risks and that they are adequately compensated for risks incurred.

Risk management is the identification, assessment, and prioritization of risks (*the effect of uncertainty on objectives*, whether positive or negative [5]) followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities [1].

For credit risks the main task is identifying at credit approval level. In this level system should be able to store all need data in the database (all documents hard copies) and analyzing this data set the composite risk index to the borrower.

Composite Risk Index = Impact of Risk event x Probability of Occurrence [5]

The impact of the risk event is commonly assessed on a scale of 1 to 5, where 1 and 5 represent the minimum and maximum possible impact of an occurrence of a risk (usually in terms of financial losses). However, the 1 to 5 scale can be arbitrary and need not be on a linear scale.

The probability of occurrence is likewise commonly assessed on a scale from 1 to 5, where 1 represents a very low probability of the risk event actually occurring while 5 represents a very high probability of occurrence. This axis may be expressed in either mathematical terms (event occurs once a year, once in ten years, once in 100 years etc.) or may be expressed in "plain english" – event has occurred here very often; event has been known to occur here; event has been known to occur in the industry etc.). Again, the 1 to 5 scale can be arbitrary or non-linear depending on decisions by subject-matter experts.

The Composite Index thus can take values ranging (typically) from 1 through 25, and this range is usually arbitrarily divided into three sub-ranges. The overall risk assessment is then Low, Medium or High, depending on the sub-range containing the calculated value of the Composite Index. For instance, the three sub-ranges could be defined as 1 to 8, 9 to 16 and 17 to 25.

Further, both the above factors can change in magnitude depending on the adequacy of risk avoidance and prevention measures taken and due to changes in the external business environment. Hence it is absolutely necessary to periodically re-assess risks and intensify/relax mitigation measures, or as necessary. Changes in procedures, technology, schedules,

budgets, market conditions, political environment, or other factors typically require re-assessment of risks.

II. PROBLEM STATEMENT

The system consists of 3 parts.

1. Determination of the degree of credit risk in the field of credit approval
2. As a result of monitoring the customer's payments assess the risk of default or nonpayment of loan for any other reason
3. Reminder Procedures

At the credit approval stage fuzzy logic was used for the evaluation of credit risk. All old methodologies use interval type evaluating parameters. This approach sometimes gets wrong results, e.g. In old systems borrowers salary was fragmented to intervals such 200-400. And the risk index is changing from 199 to 200. We solve this using fuzzy sets and linguistic variables to evaluate borrower parameters [3].

All information about borrower will be registered in the system. At this stage all collected degrees and information is investigated and one riskiness degree is setting for the borrower. And this application follow the flow with this degree and last chief risk officer is decide to give or not the credit to this customer.

Second part is Early warning system. The immediate goal is the consistent and uniform trigger of the review process and thus a reduction of the individual process and assessment risk.

Basically, two models can be distinguished [4]:

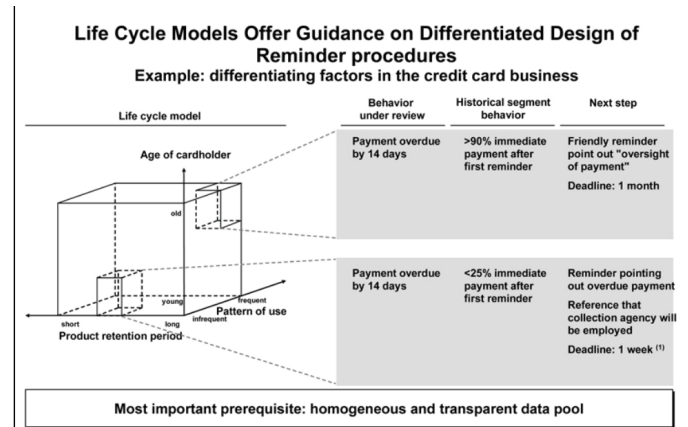
- Heuristic models (in particular risk grids)
- Empirical statistical procedures (in particular discriminant analysis)

Next chart shows a list of common risk signals:

Common Risk Signals in Static Early Warning Systems Illustrative selection		
Retail customers	Corporate customers	Updating intervals
Overdrafts	Overdrafts	Daily
Insufficient credit transactions	Insufficient credit transactions	
Pledges	Pledges	
Delays in interest/principal repayment	Delays in interest/principal repayment	Monthly
	Markedly increased utilization of credit lines	
	Evidence report	4 times per year
	Industry information	

For credit card business, for example, banks could use the variables retention period, age of the cardholder, and pattern of use (infrequent, average, frequent use) to design the grid. The resulting segments contain records about the behavior of the

cardholders comprised there in. Comparing the exposure under review with the other exposures in the same segment makes it possible not only to make a statement about the probability of default, but also to draw conclusions for the further procedure with regard to the exposure. Next chart illustrates this procedure [6].



Reminder procedures are part of the credit monitoring of individual credit exposures. The system registers the occurrence of a default on interest or principal repayment, a collection letter automatically sent to the borrower. The length of the waiting period has to be stipulated in the internal guidelines and implemented in the systems. This ensures that collection letters are sent out in time in every case.

For business reasons, it is possible to exclude certain customers from the standardized reminder procedures (individualized reminder procedures [7]).

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