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Role of Credit Strategies on Internal Credit Scoring: a Case Study of Iranian Private Banks

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Abstract: The aim of this study is to explain credit strategies of the private banks in internal credit scoring of consumers by performing case studies on three Iranian private banks and presenting solutions for improvement. Banks' credit strategies model tested based on Iran Central Bank's directives, and related dimensions. Statistical population includes: a) Credits encompassing the expert or the credit sector head; b) Branches including the superintendent, deputy, or head of the branches of three private banks of Tehran city, and an individual was selected from each branch or credit department. A questionnaire helps to collect and analyze the banks. Based on model, Proportion and Friedman test examines hypotheses. Analyzing the research data shows that by testing the hypothesis in each sample banks separately and cumulatively, half or more than a half of respondents selected the effectiveness options based on which the confirmation of the presented hypothesis is gained. The model of this research includes new dimensions that are in symmetry with the environment in which the most important indices mentioned by I.R. Iran Central Bank for awarding facilities to the consumers are cumulatively appraised.

Keywords: Credit Assessing; Credit Risk; Credit Reporting; Credit Scoring Models; Bank Strategies.

I. Introduction

Activities of Banks and Finance & Credit Institutes for awarding facilities which make them vulnerable to related risks are in compliance with Islamic contracts classifications in banking system, issuing bill of guarantee, and opening various kinds of letter of credits. However, the banks which have been mainly using credit collaterals for awarding facilities in the past years have faced defaults in reimbursement of the claims. Since, in the time of economic crisis, this problem might rise in any conditions and most of the countries even with credit assessment system (CAS) face outstanding claims problem, having a CAS and equipping the banks with CAS assures the reimbursement of the awarded facilities. By this system, the banks are obliged to closely identify their customers and make mutual relations with them; as a result, the system will not create an obstacle between the bank and customers [12]. Scoring the applicants of the credit facilities and forecasting the probability of default (PD) which are applicable by credit assessment (CA) and by relying on people's information and credit are the most basic and necessary principles of risk management in the banks, and Finance & Credit Institutes [24]; as a result of both the scoring and forecasting PD, the banks will be able to decide effectively about the awarded credits and facilities with the minimum administrative formalities [50]. Today, the most important reason of bankruptcy of the banks and other Finance, Credit and Investment Institutes is the risk of default. If the customer is not selected properly, the reimbursement of the facilities will not be done on the due date and this may result in disorder in both the banking system and the state economy [39]. Since credit scoring means quantifying the PD in future reimbursement of the customer [30-33], credit strategies of the bank along with the presented credit score is known as an effective element in making decision on whether they award the facilities to the customer.

II. Literature Review

Credit risk: It's known as default risk, means that lenders lose their money in part or completely by virtue of non-reimbursement of the loan by the borrower, and these results in loss for the loaner. Current credit risk is the probability of loss due to direct or indirect changes in credit level of borrowers [36]. Increasing credit risk could be one of the reasons behind the both bankruptcy and dissolution of the corporations consisting the banks and Finance & Credit Institutes. For conserving both unity of international finance markets and decreasing international financial risks, standards and processes are prepared, which have a key role in international financial negotiations and transactions; one of their most important goals is to bring the national viewpoints of various countries closer in the field of risk management [4]. Measuring credit risk, which has been analyzed in the national and international scientific assemblies, is an important issue; plus, it is one of the main concerns and challenges of the finance industry. Most of the credit risk models cannot measure the credit risk in financial crisis contexts of the world; therefore, agents, legislators, and universities of finance in all parts of the world try to improve the credit risk modeling for the countries, corporations, and financial institutes [36]. The rudiments of

credit risk management are meticulous risks and timely identification of one's within both processes and activities related to awarding facilities [4]. Credit risk management includes three initial methods as follows [10]:

Credit scoring system: Main goal of credit scoring system is to judge awarding or not awarding the facilities to a new applicant as per personal profile like age, income, residential ownership, and so on.

Behavioral scoring system: Behavioral scoring system also used for selecting applications about deferring the reimbursement or the second loan condition after regarding the customer's credit status intends to elucidate the existing customers' behaviors then forecast both their future purchasing behaviors and credit status as per account transaction data, interest reimbursement history, and credit records, etc [10-19-40].

Recovery scoring system: It is often known as a variable of behavioral scoring system. That Credit scoring as one of the dominant analysis methods is assessed in credit risk. Credit scoring models have been covered extensively in the fields of statistics, machine-learning, and artificial intelligence [49]. Also relying on credit strategies and managing to create such strategies database along with credit reference database will lead to making more reliable decisions on accepting the facility.

Credit Assessment System. Included credit reporting, credit scoring, Credit Scoring Models.

Credit Reporting. Facilities, goods or services are provided to the consumers based upon decisions which are made by lenders who prefer to access the consumer credit reporting than other ways. Credit reference databases are applied for assessing not only credit application of consumers but also their creditworthiness. Third-party providers (Credit registries), who are in charge of managing the databases, collect pertinent information loanees' records like the payment history and accounts, issuing credit reports and at last well-ordered information to both the credit industry and the market [15]. Conspicuously, it is mandatory to have credit reports with a reasonable degree of authenticity and comprehensiveness to realize the significance of credit reporting system. Furthermore, the level of efficiency will increase in the process of awarding credit facilities in case of collecting more precise and complete information by credit-reporting agencies. Hence, consumers and lenders both will enjoy of cost reduction [5].

Credit Scoring. The significance of credit scoring is more than ever before as there are improvements in recent years; consequently, there is a pile of credit data in credit departments of the bank Data mining methods through which analyzing such amount of data involves less workforce and costs is applied. Hitherto, with the purpose of managing credit score issues a variety of data mining methods are introduced while each of them has both their own benefits and drawbacks. Therefore, there is a lack of reference for comprehensive issues that introduces data mining methods and gains the consensus of all [26]. Certainly, lenders need to realize the degree to which they can rely on their payers and how much facilities they can be awarded. On the one hand, any loaner has the legal right of gaining profit of its business; on the other hand, consideration of privacy and data security of consumers need to be noticed and supported as well. The views will be met in case those involved in credit reference agencies and lenders can get the confirmation of consumers for legal consumers' data processes. As stated by the law, it could be confirmed if there is complete awareness, freedom, and clarity of consumers [15]. Credit scoring process aims to do qualification of each customer for meeting his/her obligations that shall be predicted in a precise manner [27]. To be more precise, estimation of credit risk allows a more objective and faster decision making process for dedicating facilities [49]. The analytical method of Customer credit scoring [47] scores customer upon one or several behavioral aspects [52]. For the first time Fisher defined credit scoring as a method for categorizing the population which is studied according to characteristics of each and every person in 1936 [48]. Credit scoring not only accelerates and units the process of giving facility, but also automates it [28-37]. It refers to the point that it is not necessary for a person to intervene in order to assess credits at this method; furthermore, it lowers the cost of awarding credits [13-28-45]. The finance & credit institutes use credit scoring to evaluate risks which are associated with awarding credits process based on numbers to be dedicated to an individual shortly [28].

Credit Scoring Models, the first models of credit scoring were constructed in 1930 by authors such as [14-16-26] then since 1960 they were developed by studies of [2-7-26], as well as others such as [26-31]. With the purpose of reaching to pleasant scoring model(s) for lowering or minimizing the credit losses, suggested various credit scoring models are [51]: Linear discriminate [35], Logistic regression [46], K-nearest neighbor (KNN) [21], Decision tree [32], Linear programming [18-20], Integer programming [44].

Application of Credit Scoring Models, Credit scoring is mainly used for deciding whether an individual is deserved facility awarding [28-37]. Recently, it is also applied by Finance and Credit Institutes to determine "credit limits, manage existing accounts, and forecast profitability of the consumers or the customers" [28-29]. Crediting small & medium enterprises (SME) have been decided by credit scoring as well [1-28-38]. Credit scoring has some more applications as well: assessing the possible date of regular payment of rental by the lessee(s), determining rendering services offered by the suppliers of welfare services in the U.S to the

consumers, making decision on whether recruit employees based upon their credit score and credit history, particularly for those who are going to work with money, [11-28] and in mortgage/pledge industry [28-44].

Internal Credit Strategies of Bank. Observing principles, terms, regulations, and strategies is needed in addition to fulfilling CA with the purpose of awarding facilities, employing International Standard Industrial Classification of All Economic (ISIC), classifying the good payer and bad payer customers, and the like. These are achievable by obeying strategies made by Central Bank. When customers need to receive bank facilities, saving credit history of them is not the only criterion [6]; to be able to score customers, customers' credit history along with both strategies of central bank and internal strategies of the bank should be processed. It will forecast the customer behavior for the given facility. Internal credit strategies of the bank coupled with calculated credit score are recognized as the effective factors for whether admit or refuse awarding facility. Hence, after the banks consider terms and regulations of central bank, internal credit strategies of them are used as a base for making decisions, managing their related strategies, amending or updating the strategies within a specific period in order to make gradual improvement and reduce in outstanding claims. PD of applicants are usually assessed by a recognized type of tool manages the internal strategies of the bank and credits scoring in CA [41].

Political-Supervision Package of Central Bank, focused on the political-supervision package, helps banks deciding to award facility to their applicants based on its relevant economic class [22].

Portfolio Status of the Bank, Finance and Credit Institutes, such as trading banks, have to receive the deposit of people as their major task and award facilities to their clients according to Islamic banking contracts. Thus, after looking at the customer credit risk, they process the applications to check if they deserve to get facilities. So far, bankruptcy and loss of banks and Finance and Credit Institutes mainly have resulted from troubles and challenges in facility portfolio management. The reason is that the outcome and diversity of risks will be the major part of a facility portfolio management model in various economic classes' loaning opportunities [4].

Bounced Cheque Inquiry, Due to the significance of Central Bank database for bounced cheques as a negative status in credit reports of the system a decision was made by Session of Council of Article 5 under CAS By-law (June 13, 2011) with the purpose of linking bounced cheques database of central bank to credit reference database [23].

Remaining obligations of the Customers Inquiry, To be able to make an appropriate decision upon awarding facility, a precise analysis of a client's financial status and finance justifications is essential. Client's financial status is significant for the bank and it needs to get sufficient information regarding the status. Does the applicant have sufficient financial solvency to deal with unexpected events? Is there conformity between applied facilities and their financial status? To be able to assess the customer's financial status, holding all financial documents, deeds of the properties and vehicles, customer's credit history, inquiring about the customer's obligations from the Central Bank, are essential for the banks [43].

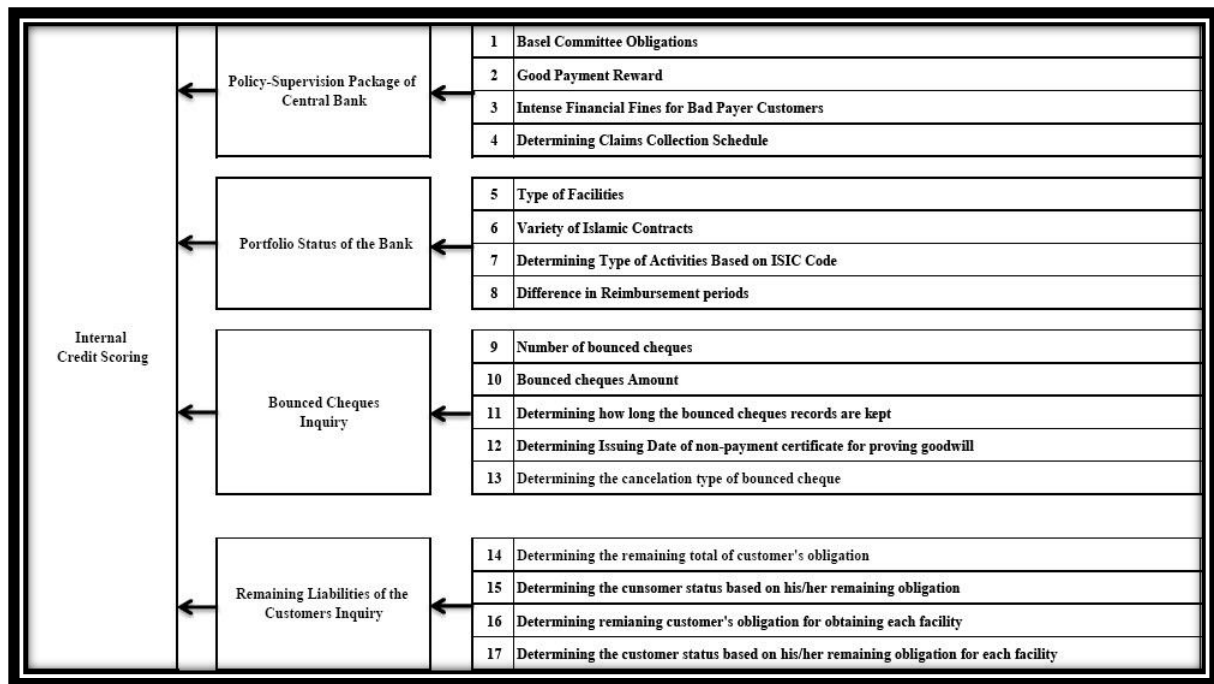
III. Research Methodology

Research Model and Variables. This study is an applied research in terms of the aim and a descriptive-survey in terms. Fig 1 explains the role of bank's credit strategies regarding effective independent variables on internal credit scoring of consumers in studied banks. Hypothesis. In order to analyze the role of bank's credit strategies on bank's internal credit scoring of consumers, major hypothesis is: Implementation of bank's credit strategies has an effect on internal bank's credit scoring of consumers.

Population and Sample Size. Criteria for selecting the subjects were divided into two groups in each branch of bank: a) Credits encompassing either the expert employees or the head of the credit sector; b) Branches including the superintendent, deputy, or the head of branches of three private banks of Tehran city; Namely, Karafarin Bank, Sarmaye Bank and City Bank. It is worth noting that one person was selected from each branch. The sample size was determined by Cochran formula with 95% confidence level. So n was obtained 63. Sampling was completed by assigning in proportion to each bank.

Research Validity and Reliability. In order to assess the validity of measurement, factors and indices amended and finalized by interviewing 15 persons of bank experts including the head or deputies of the branches. Finally, the design of the questionnaire was based on deep view. So the Cronbach's Alpha method is one of the ways of examining reliability used in this research. The quantity of Cronbach's Alpha was obtained using SPSS software as 0.917, which is appropriate for the mentioned questionnaire.

Hypothesis Testing. With respect to the assessment instrument and a qualitative-sequential, a variety of non-parametric tests used to test hypothesizes. Alternatively, Friedman test was used for prioritizing them.

Figure 1: Research conceptual model for explaining the credit strategy of the bank

IV. The Results of Hypothesis Testing

The hypothesis examined on the understudy banks cumulatively and separately. Table 1 shows the results.

Table 1: Research hypothesis test results

Banks	Hypothesis's	Frequency	$\hat{P}$ (%)	Z^* test	Results
Karafarin	Main Hypothesis	11	0.79	2.14	H_0 Accepted
	Subordinate hypothesis 1	8	0.57	0.53	H_0 Accepted
	Subordinate hypothesis 2	5	0.36	-1.07	H_0 Accepted
	Subordinate hypothesis 3	11	0.79	2.14	H_0 Accepted
	Subordinate hypothesis 4	13	0.93	3.21	H_0 Accepted
Sarmayeh	Main Hypothesis	22	0.88	3.80	H_0 Accepted
	Subordinate hypothesis 1	17	0.68	1.80	H_0 Accepted
	Subordinate hypothesis 2	18	0.72	2.20	H_0 Accepted
	Subordinate hypothesis 3	23	0.92	4.20	H_0 Accepted
	Subordinate hypothesis 4	24	0.96	4.60	H_0 Accepted
City	Main Hypothesis	13	0.54	0.41	H_0 Accepted
	Sub- hypothesis 1	14	0.58	0.82	H_0 Accepted
	Sub- hypothesis 2	10	0.42	-0.82	H_0 Accepted
	Sub- hypothesis 3	14	0.58	0.82	H_0 Accepted
	Sub- hypothesis 4	17	0.71	2.04	H_0 Accepted
Accumulation	Main Hypothesis	46	0.73	3.65	H_0 Accepted
	Sub- hypothesis 1	39	0.62	1.89	H_0 Accepted
	Sub- hypothesis 2	33	0.52	0.38	H_0 Accepted
	Sub- hypothesis 3	48	0.76	4.16	H_0 Accepted
	Sub- hypothesis 4	54	0.86	5.67	H_0 Accepted

Confirming the main hypothesis in Karafarin Bank shows: the age range of 67.70 percent of those who answered to the questionnaire were between 28 to 36; 56.41 percent of them were men; 56.41 percent of them

were married; 50.80 percent of them were bachelor's degree holders; 73.39 percent of them had work experience for less than 8 years and the entire respondents were employees of credit department. Confirming the main hypothesis in Sarmaye Bank shows: the age range of 38.72 percent of those who answered to the questionnaire were between 44 to 52; 77.44 percent of them were men; 70.40 percent of them were married; 70.40 percent of them held equally high school diploma and bachelor's degree; 45.76 percent of them had work experience between 24 to 32 years; 31.68 percent of them were the head of the branch or the head of credit department. Confirming the main hypothesis in City Bank shows: the age range of 29.27 percent of those who answered to the questionnaire were between 28 to 36; 38.23 percent of them were men; 44.98 percent of them were married; 42.77 percent of them held bachelor's degree; 38.23 percent of them had work experience for less than 8 years; and 42.77 percent of the respondents were employees of credit department. Confirming the main hypothesis in cumulative form of the data in sample banks show: the age range of 34.75 percent of those who answered to the questionnaire were between 28 to 36; 56.79 percent of them were men; 57.96 percent of them were married; 44.02 percent of them held bachelor's degree; 91.71 percent of them had work experience between 24 to 32 years; and 45.26 percent of the respondents were employees of credit department. Results of Chi-Square test are as Karafarin: 3.0516; Sarmayeh: 51.312; City: 35.060; χ^2 based on additive property: 110.304.

V. Conclusion and Recommendation

The striking result to emerge from the data is that since trading banks are specialty-based for awarding facilities, lenders, namely Karafarin Bank, sarmaye Bank and City Bank, are exposed to credit risk and borrower's PD. Failing to use measurement system and credit risk management results in increasing outstanding claims and writing off bad debts. Hence, there must be some solutions through which these banks can assess credit risk and analyze applicants' credit in order to decide on awarding facilities; as a result, the sample banks, as creditors, will be able to preserve their organization. From the other side, Karafarin Bank, Sarmaye Bank and City Bank are able to calculate internal credit scores of the consumers as per their internal strategies and make more reliable decisions on accepting or rejecting the facility applications by using credit score obtained by Credit Bureau system. This system is the result of data sharing of economic agencies including other banks, finance and credit institutes, leasing, insurance companies, telecommunication companies, and the like. Designing and implementing effective strategies of the banks along with credit score, help Karafarin Bank, Sarmaye Bank and City Bank in rendering facilities to their consumers. Therefore, these banks should study the credit history in all consumers' demand in continuous periods and enable the changes and updates of their strategies periodically for development and improvement of the organization.

VI. References

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