The Factors Affecting the Credit Risk in the Iranian Banks: The Case Study of Mellat Banks

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Abstract:
This study aimed to identify the factors affecting credit risk of Iranian banks, with special reference to customers of Mellat bank at Gholston province of Iran. By applying "DEMATEL" technique, we could select only 186 document out of 235 for the period five years from, 2011 to 2015. For this purpose, first, Theoretical framework and background related to the issue of research was studied and all of the factors affecting credit risk were identified and the information related to factors affecting the credit risk were collected from bank records of customers who received the credit facility from Mellat Bank of Golestan province at Iran. The results of logistic regression analysis and the results of "DEMATEL" technique showed that among selected variables there is a significant relationship between credit risk of customers and liquidity ratios, Leverage ratios but, in other side there is an inverse relationship between credit risk of customers and Profitability ratios, Activity ratios and Qualitative variables.

Keywords: *Credit risk, debt ratio, Qualitative variables, Liquidity ratios, Leverage ratios.*

1- INTRODUCTION

It is true that, the credit function of Banks enhances the ability of investors to exploit desired profitable ventures. Credit creation is the main income generating activity for the Banks. But this activity involves huge risks to both the lender and the borrower. The risk of a trading partner not fulfilling his or her obligation as per the contract on due date or anytime thereafter can greatly jeopardize the smooth functioning of Bank's business. On the other hand, a Bank with high credit risk has high bankruptcy risk that puts the depositors in jeopardy. In a bid to survive and maintain adequate profit level in this highly competitive environment, Banks have tended to take excessive risks. However, it exposes the banks to credit risk. The higher the Bank exposure to credit risk, the higher the tendency of the Banks to experience financial crisis and vice-versa. The goal of credit risk management of every bank is to maximize a bank's risk-adjusted rate of return by maintaining credit risk exposure within acceptable parameters. 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 (Brown and Moles, 2012).

Over the past few years, the Iranian banking sector has become more and more market oriented. Banks take risks, to provide loans and services. This fact is also applies to Mellat bank, whose more than half of their asset portfolio is constituted by loans and advances. Therefore, the main purpose of this study is to follow a comprehensive approach towards identifying credit risk influence factors. In this regard the study aims to develop a workable conceptual framework to be applied for the assessment of credit risk.

2- Review of Empirical Literature

Empirical literature identifies several factors as affecting credit risk in the banking industry. Therefore, it is a requirement for every Bank worldwide to be aware of the need to identify measure, monitor and control credit risk while also determining how credit risks could be lowered. This means that a Bank should hold adequate capital against these risks and that they are adequately compensated for risks taken. Narayan s., kalpana s., sanhita s. (2003). However, there have been mixes of approaches used by the literature to analyze factors that possibly influence credit risk. Credit risk is defined as the risk that the promised cash flows from loans and securities held by banks and financial institutions may not be paid in full (Saunders & Cornet, 2008). Credit risk is the main cause of bank failures, and the most visible risk facing banks' managers (Gup et al, 2007). In the view of (Rose and Hudgins 2008) credit risk is the probability that some of the financial institution's assets, especially its loans, will decline in value and perhaps become worthless. (Al-Smadi and Ahmad 2009) indicate that an in-depth study and understanding on the manner in which internal and external factors contribute to credit risk warrant further analysis. At macro level, GDP, inflation and market interest rate have been identified as having significant impact on credit risk. While at micro level, previous non-performing loans, loan growth, loan concentration and bank size are significant determinants. Some of the research works are focused on internal variables only (Moses 2013), (Ayni and Moki, 2012), (Nawaz 2012), others provide separate evaluation of external variables including macro and industry factors (Demirguc-Kunt and Huzinga, 2009) and (Njanike, 2009). The study of (Wanzenried and Dietrich 2011), stated that the Bank size should be positively associated with its performance. And (Tseganesh' 2012) investigated some

of Bank specific and found that, macroeconomic factors affecting Banks liquidity and they have an impact on financial performance. The rest few also have consideration for both internal and external variables (David 2013), (Grigori and Igor 2011). In terms of findings, (Kurawa 2014) observed that 50% of the studies reviewed by him depicted negative relationship of credit risk with profitability. The literature mostly has used model based evaluation of the determinant factors of credit risk factor for banks.

However, a matrix based assessment of factors that impacts the level of credit risk are scanty. Even if there appear a very close link in approach and variable setting, the below stated conceptual framework is applied to set the model of the study and to contribute for the literature. In terms of variable definition, the literatures reviewed are mostly focused on variables which can easily be measured through quantitative ratios. Therefore, it seems highly dominated by quantity of credit risk variables that are directly inferred from the publicly available financial records of banks. Even in cases of studies done using both internal and external determinant factors, it is observed that quality of risk management related issues are not given the required attention. Hence, some studies ignore qualitative parameter which can indirectly be measured through mediating variables and can have utmost influence in the level of credit risk.

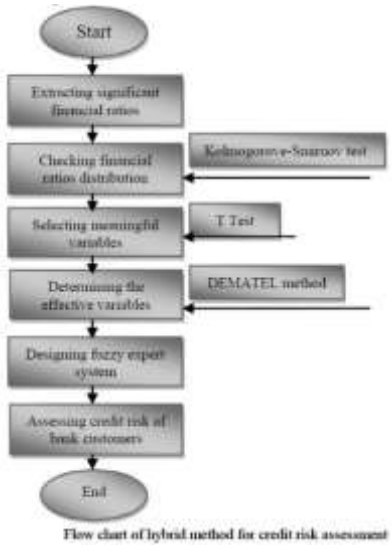
1- Research Methodology

The major steps followed in the practical study of this research, have been implemented in Mellat bank. Here, the steps briefly have been explained as follows:

The schematic diagram provides a conceptual framework for holistic evaluation of the determinants and effects of credit risk.

The flowchart of the research is shown in Figure below:

Step1	Extracting significant financial ratios for credit risk assessment of bank customers by balance sheet
Step2	Checking financial ratios distribution to make sure the rations are normal using Kolmogorove-Smirnov test.
Step3	Selecting meaningful variables according to specified distribution type by applying T test.
Step4	Determining the effective financial ratios based on DEMATEL method.
Step5	Determining the membership functions for the variables.
Step6	Specifying rules to make clear the relations between Inputs and outputs.
Step7	Credit risk assessment for bank customers based on the designed system.



Flow chart of hybrid method for credit risk assessment

The flowchart of the research is shown in Figure below:

2- Hypothesis of Study

There are possibilities of Factors affecting the Level of Credit Risk in the Mellat

bank of Iran at Golestan province. Therefore, our hypothesis are:

There is a Correlation Between credit risk of customers and Liquidity ratios of Mellat banks.

There is an Inverse Relationship Between credit risk of customers and Leverage ratios of Mellat banks.

There Is No Significant Relationship Between credit risk of customers and Profitability ratios of Mellat banks.

There Is No Significant Relationship Between credit risk of customers and Activity ratios of Mellat banks.

There is No Significant Relationship Between credit risk of customers and Qualitative variables (general.

3- Methods of data collection

This research method is an empirical research that, uses multiple resources and evidence to investigate a phenomenon in a real context when the boundaries between phenomenon and context are not clear, therefore for collecting the required date the following steps are taken. Visiting the banks physically, and conducting an interviews with bank managers and some customers then, Referral to the documents of the costumers archival data were extracted from annual reports of 657 quoted customers of the Mellat Bank of Golestan province. All the documents were classified according customers who have received legally the facilities of credit in these years from 2011 to 2015. Later by applying the "DEMATEL" technique the sample size was reduced to 126 cases which, had the necessary information to use in the study. Therefore, we could select only 126 document out of 657, for a period of five years from, 2011 to 2015 for the presented study.

4- Objective of the study

The objectives of the research are as follows:

1. To find a proper solution that, makes loan borrowers of the banks to pay their loans on particular period of time.
2. To introduce a useful credit risk Rating systems which, measure credit risk and differentiate the individual credits and groups of credits by the risk they pose to reduce the High risk.

5- The problem of the Research

A major activity of banks is lending which involves the risk that the borrower will not pay back the loan as they promised on. The credit risk is one of the main risks that seriously affect banks' stability. The credit risk in banking is commonly defined as the probability of a borrower defaulting his loan commitments. The main goal of a bank is to manage this type of risk because 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. The credit risk is the main cause of bank failures, and the most visible risk facing banks' managers In Islamic Republic of Iran are that, many of banks are still having problem with most of the loan borrowers where, there is little or no likelihood of repayment on time. In this respect, it is essential to identify the main factors causing this risk in order to manage it. In the following, we present the results for the main factors influencing Mellat bank credit risk in Iran.

6- Purpose of the Study

The study will investigate the relationship between various credit mitigation techniques employed by banks on unsecured loans and the overall bank performance. The study will be beneficial to Mellat banks management as its focus is on credit risk management of unsecured loans which is the core source of business for many banks. The study will present varied practices which can be shared by many commercial banks in the industry.

Finally, the study will contribute to the broader realm of business and academic research. In business, through its recommendations, the study will add value to better credit management practices in

businesses and service quality. In academia, the study will add value to academic research in the broader area of credit management. Future researchers will not only use this study as a form of reference for future studies, also suggest future research activities that can be explored.

7- Statement of the problem

Credit risk management practices is an issue of concern in every bank and financial institutions today and there is need to develop improved processes and systems to deliver better visibility into future performance. There have been controversies among researchers on the effect of credit risk management techniques adopted by various institutions. According to Saunders and Allen (2002), good selection strategy for risk monitoring is adopted by the credit unions implies good pricing of the products in line with the estimated risk which greatly affect their profitability. Mwirigi (2006) on the other hand stated that loan portfolio management and operational efficiency management are the most important to consider in CRM as they are the most important in enhancing the performance. The principal concern of this study is to ascertain the effect of various credit risk management techniques and strategies that are adapted by Mellat banks on their performance.

8- DEMATEL Method

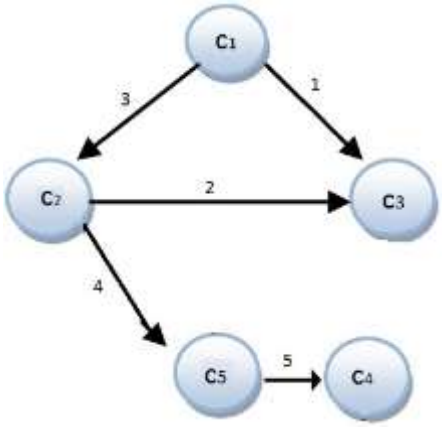
The DEMATEL method is demonstrated as a useful approach in exploring the causal and effect interrelationship of the core competences of a banks or a firms.

The DEMATEL method is based upon graph theory, enabling us to plan and solve problems visually, so that we can divide multiple criteria into a cause-and-effect group, to better understand causal relationships to plot a network relationship map. Directed graphs (also called digraphs) will demonstrate the directed relationships of sub-systems. The DEMATEL method can be summarized in the following steps:

Step 1: Find the average matrix. Suppose we have H experts and n criteria to consider. Each expert is asked to indicate the degree which represents he or she believes a criterion i affects criterion j. These pairwise comparisons are denoted by aij and are given an integer score ranging from 0, 1, 2, 3, and 4, representing 'No influence (0),' 'Low influence (1),' 'Medium influence (2),' 'High influence (3),' and 'Very high influence (4),' respectively. We can then compute the n×n average matrix A for all expert opinions by averaging the H experts' scores as follows:

$[aij]n\times n = 1H\sum Hk=1[xkij]n\times n.$

The average matrix **A** = $[xijk]n\times n$ shows the initial direct effects that a factor exerts on and receives from other factors; hence, the initial direct relation matrix has been called. In addition, the causal effect between each pair of factors in a system can be mapped out by drawing an influence



map. Figure 1, indicates an example of an influence map. Here, each node corresponds to a factor in the system and arrows represent impacts between factors. As an instance, an arrow from *C*1 to *C*2 shows the influence that *C*1 exercises on *C*2, and the strength of its effect is three. DEMATEL is able to convert the structural relations between the factors of a system into an intelligible map of the system.

To evaluate the important degree for the 15 financial ratios with the use of experts' opinions, DEMATEL Technique have been run. Below Table shows the factor scores and related values for cause and effect groups as the sum of given and received

influences on criteria. The Criteria Total Relation Matrix has been extracted from this table.

Table: 1

DEMATEL: The Criteria of Relation Matrix

THE SUM OF INFLUENCES GIVEN AND RECEIVED ON CRITERIA				
Criteria	**R**	**J**	**R+J**	**R-J**
C1	3.2372	2.9415	5.0787	2.1957
C2	3.3106	3.1526	5.1463	2 3.158
C3	2.9003	4.064	4.2643	-1.1637
C5	2.8439	3.8586	6.7025	-2.6147
C6	2.6273	1.1389	4.9662	0.5884
C8	2.5636	2.9979	5.2615	-1.5343
C9	2.6695	1.7077	5.4772	1.0618
C10	2.5161	2.689	5.8051	-0.5729
C11	2.4176	2.4201	3.6377	-0.2025
C13	1.6539	3.9217	4.5756	-2.2678
C14	2.4669	3.495	3.8619	-1.1281
C15	2.6525	2.6464	4.0989	0.7061

Evaluating credit risk for bank customers is based on the financial analysis. In first step, financial variables which are important for bank experts to assess the level of legal customers' risk, have been selected. The followings are the extracted financial ratios from the balance sheet that have been reviewed by bank experts, for assessing the loan applicants: Current Ratio(C1), Quick Ratio (C2), Asset Turnover(C3), Cash Ratio(C4), Working Capital Turnover(C5), Average Collection Period(C6), Inventory Period(C7), Debt Coverage Ratio(C8), Debt Ratio(C9), Current Debt to Net worth (C10), Gross Profit Ratio (C11), Return on Equity(C12), Return on Assets(C13), Payout Ratio (C14), Return On Sales(C15) and Debt to equity ratio(C16). Since 16 variables between financial ratios for making decision to rank credit customers have been extracted from their financial balance sheet and some of them could be meaningless, they have not been involved in decision making process and have been removed in next modelling. So the opinions from the 18 bank financial experts have been obtained by Likert scale questionnaire. To select the useful solution, it is necessary to specify statistical status of sample distribution. For this purpose, the Kolmogorove-Smirnov test has been used.

Table: 2

TEST RESULTS of KOLMOGOROVE-SMIRNOV								
Criteria	**N**	**Normal Parameters**		**Most Extreme Differences**			**Kolmogorov-Smirnov Z**	**Asymp. Sig.**
		Mean	**Std. Deviation**	**Absolute**	**Positive**	**Negative**		***(2-tailed)***
C1	16	5.50	0.52	0.34	0.36	-0.41	1.52	0.15
C2	16	4.39	0.72	0.5	0.22	-0.45	1.31	0.14
C3	16	5.56	0.53	0.46	0.33	-0.23	1.44	0.23
C4	16	4.22	0.83	0.34	0.24	-0.25	1.04	0.27
C5	16	4.50	0.94	0.36	0.18	-0.27	1.13	0.12
C6	16	4.50	0.52	0.43	0.34	-0.39	1.44	0.18
C7	16	4.11	0.58	0.45	0.36	-0.34	1.55	0.29
C8	16	3.78	0.63	0.40	0.35	-0.37	1.27	0.19
C9	16	4.72	0.96	0.33	0.14	-0.26	0.93	0.33
C10	16	4.50	0.54	0.43	0.34	-0.33	1.48	0.17
C11	16	4.83	0.38	0.60	0.33	-0.55	2.15	0.22
C12	16	5.61	0.51	0.49	0.27	-0.35	1.64	0.25
C13	16	3.94	0.72	0.35	0.26	-0.28	1.03	0.28
C14	16	4.89	0.76	0.42	0.23	-0.25	0.92	0.37
C15	16	4.39	0.50	0.49	0.37	-0.26	1.67	0.16
C16	16	4.72	0.91	0.33	0.18	-0.28	0.96	0.38

9- **Data Analysis Techniques**

To test the hypotheses and to perform the data analysis, paired samples, t-test and Levene's test were applied to determine the relationship. The software's of SPSS and Micro Soft Excel were used.

General variables include the background of the company , history of collaboration with the Mellat Bank , the loan amount , the value of the collateral to get loans and six-month average of the company's accounts to check them pay through descriptive statistics . The following table shows descriptive statistics general indicators for the sample companies.

Table: 3

Descriptive statistics general indicators\

Basic indicators	minimum	maximum	Average	Standard deviation
Active record	3	22	10	5.5
History of cooperation with banks	2	10	5.35	2.26
Six -month arithmetic average (million) rials	450	1500	987.85	313.17
Loan Amount (million rials)	1400	33000	13152.52	9625.81
The ratio of the collateral to the facility	0.8	1.5	1.3	0.179

As previously mentioned, the logistic regression model was used to estimate the probability of default by customers. Total observations used in estimating the model included 126 legal entities that have received loans from the Mellat Bank in Golestan. The following table estimating the coefficients of the independent

variables in the logit regression model show.

Table: 4

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
n. earnest	Equal variances assumed	3.946	.054	-1.369	40	.179	-.07625	.05570	-.18882	.03632
	Equal variances not assumed			-1.502	34.66	.142	-.07625	.05077	-.17935	.02685

TABLE: 5

Estimated Logit function of coefficients

Variable name	B. coefficient	S.E	Wald	df	Sig	Exp (B)
History of cooperation with banks (X1)	-0.748	0.199	14.197	1	0	0.473
Delayed debt history (x2)	1.662	0.793	4.395	1	0.036	5.268
Quick ratio (x3)	-0.808	0.237	11.61	1	0.001	0.446
Turnover ratio of Current Asset (x4)	0.592	0.728	0.661	1	0.416	1.807
Average collection period (x5)	0.031	0.011	8.371	1	0.004	1.032
Ratio of current liabilities to total assets (x6)	-7.156	3.496	4.189	1	0.041	0.001
Return on assets (x7)	-18.717	9.007	4.318	1	0.038	0
Working Capital to Assets Ratio (x8)	-7.096	5.422	1.713	1	0.191	0.001
Ratio Of Bank Debt to Total Debt (X9)	5.929	1.926	9.481	1	0.002	375.907
Coefficient (c)	5.554	2.491	4.97	1	0.026	258.233

According to the above table, the overall shape logit function will be as follows:

$$L1 = 5.554 – 0.748x1 + 1.162 x2 – 0.808$$

x3 + 0.592 x4 + 0.031 x5 –7.156 x6 – 18.717 x7 -7.096 x8 + 5.929 x9

According to the above function, the probability of the risk of non-repayment for each customer is calculated as follows:

P = [1+ Exp. {5.554 – 0.748x1 + 1.162 x2 – 0.808 x3 + 0.592 x4 + 0.031 x5 –7.156 x6 – 18.717 x7 -7.096 x8 + 5.929 x9]

We multiply each entry of the matrix M reverse highest total in to row (a) of the matrix. This multiplication leads to deviations from trend in the answers is not available because the answer may be in the form of direct relations (between any two elements A and B). And indirect effects of the elements on each other clearly less than its direct effects will be.

TABLE: 6
Matrix relative intensity of the direct relations

Factors Affecting Credit Risk (M)	A	B	C	D	E	F	G
History of cooperation with banks (A)	0	0.118	0	0	0	0	0.227
Bank debt to total debt (B)	0	0	0.097	0	0	0	0.199
Return on assets(C)	0	0.175	0	0.179	0.169	0.233	0.244
Current debt to total assets (D)	0	0	0.159	0	0	0.233	0.176
Periodicals Collection (F)	0	0	0.204	0.178	0	0	0
Quick ratio (G)	0	0	0.165	0.207	0.191	0	0.199
Deferred debt history (H)	0.158	0	0	0.253	0	0.179	0

Total infinite sequence of direct and indirect effects of the elements on each other (with all the feedback possible) as a geometric progression, based on existing legislation of the graph are calculated.

TABLE: 7
Matrix relative intensity of indirect relations

Factors Affecting Credit Risk (M)	A	B	C	D	E	F	G
History of cooperation with banks (A)	1.05	0.133	0.052	0.113	0.026	0.093	0.316
Bank debt to total debt (B)	0.047	1.039	0.151	0.136	0.048	0.118	0.298
Return on assets(C)	0.09	0.229	1.254	0.053	0.031	0.153	0.567
Current debt to total assets (D)	0.066	0.062	0.309	1.276	0.136	0.441	0.415
Periodicals Collection (F)	1.03	0.058	0.311	0.335	1.087	0.188	0.189
Quick ratio (G)	0.073	0.071	0.359	0.5	0.305	1.28	0.461
Deferred debt history (H)	0.195	0.049	0.148	0.427	0.091	0.346	1.234

In the table below (A) means of cooperation with the Bank, (B) ratio of bank debt to total debt, (C) Return on assets, (D) ratio of current liabilities to total assets, (E) average collection period of receivables, (F) quick ratio, (G) of the debt is outstanding.

TABLE: 8
The influence elements on each other

Variables Order	Variables influenced row (R)	Variables Order	Permeable variables column(J)	Variables Order	Total variable penetrance (R+J)	Variables Order	The effect of interactions (R-J)
C	2.284	G	2.481	D	4.023	C	0.7
F	2.049	D	2.318	F	4.023	A	0.232
D	1.705	F	1.974	G	3.97	B	0.126
G	1.492	C	1.584	C	3.868	E	0.47
E	1.194	E	0.724	E	1.918	F	0.075
B	0.83	B	0.704	B	1.534	D	0.613
A	0.783	A	0.551	A	1.334	G	-0.99

Maximum number of totals in row (R) represents the factors that greatly affect the other elements. For example, return on assets of the first column of the above table it has the maximum impact on credit risk. In contrast, the least effect on their history of cooperation with the Mellat Bank of themselves. The biggest number of Total column (J) indicates factors that are affected. At the same time Variable deferred debt richest history and history of cooperation with the Bank in the last row of the third column is not influenced by any factors. Thus, the columns J+R represents the hierarchy of factors influenced and column J-R shows the hierarchy of permeability.

In other words, the most effective variable is the return on assets and on the other hands operating variable of liabilities History it has the most effects on it.

10- Empirical Result

The empirical result revealed that majority of quantity of risk related factors, all variables of the quality of credit risk management and one of the direction of credit risk related variables appear significant to affect the proxy measure for credit risk.

The quantity of credit risk variable, the ratio of loans to total asset has significant relationship with credit risk exposure. The relationship witnessed that as the share of loan book from the total asset increases the exposure to credit risk will be large and significant. This is in line with the expected result as Mellat banks are dependent on the intermediation business for their earning sources; the possibility of exposure to high risk borrower base is on the high side. In addition, the restricted access to high earning investments than loans and advances oblige banks to flex the credit approval procedures. However, the empirical result shows that few and well managed large exposures could contribute positively to reduce credit risk of banks. This is supported by the ease to institute credit risk management strategies such as strong follow-up, portfolio management and monitoring system. These have categorized the factors into three broad groups: bank specific factors, industry and macroeconomic factors. (Gonzalez-Hermosillo et al 1997); (Demetriades and Luintel, 1996) among others find bank specific factors including real loan growth rates, size of loan portfolio, bank size, operating efficiency, branch outlets among others as affecting credit risk. (Das and Ghosh 2007) identified macroeconomic factors affecting credit risk.

11- Conclusion

This paper has empirically examined the determinants of credit risk held by Iranian Mellat banks year from 2011 to 2015 periods. This study takes its importance from the numerous structural changes in the Mellat banking sector (globalization, deregulation, internationalization, technologies of information and communication) that have exposed them to a number of risks and stated important challenges for their stability.

The empirical results of this study show that the public ownership increases the bank credit risk. Moreover, the prudential regulation of capital decreases the credit risk taken by Mellat banks in Iran. This result accounts for the willingness of these banks to respect the bank regulations. Besides, the banks' characteristics are also important factors influencing the levels of risks taken by Mellat banks.

The most important tasks of any bank is to provide credit to its customers. In general, the results from this study with respect to the question of the study can be summarized as follows

There was a statistically significant relationship between financial and non-financial variables affecting the credit risk of Mellat bank of Golestan province is confirmed.

The regression analysis showed that, the variable rate of return on assets, quick ratio and a history of working with banks to credit risk are inversely related.
Variable of current debt to assets, bank debt to total debt, the period of collection of receivables and liabilities of the bank based on coefficients obtained are directly related to the credit risk.
According to the coefficients of the regression model, the results of research hypothesis we found is as follows:

The first hypothecs: Liquidity ratios has an affect on credit risk of customers. Quick ratio r = 0.808 and ratio of turnover funds r= 0.592 with regression of coefficient is statistically significant at the 5% level.
The second hypothecs: Leverage ratio has an affects on the credit risk of customers. Current debt to total assets ratio r = 7.156, is significant at the 5% level.
The third hypothecs: Profitability Ratio has an impact on the credit risk of customers. Return on assets ratio r = 18.717 is significant at the 5% level.
The forth hypothecs: Activity ratios has an affect the credit risk of customers.The ratio of collection period of r = 0.031 at 0.5% level is significant.
The fifth hypothecs: The proportions of qualitative variables affect the credit risk of customers. History of cooperation with banks regression coefficient 0.748 and the ratio of outstanding debt regression coefficient 1.662, and the ratio of bank debt to total debt regression coefficient 5.929, significant are at the 5% level.

In general, the results of this survey show that in the financial and non-financial variables some are in distinguishing good customers and a more effective role to non-creditworthy. These variables include the rate of return on assets, quick ratio, the ratio of current liabilities to total assets, deferred debt to the bank's history, average collection period, the ratio of bank debt to total debt and former partner with the bank. As can be seen liquidity ratios, investment and debt ratios are important assessment of corporate customers and a company's ability to meet the obligations reflecting the company's ability to meet short-term and long -term commitments.

At last the result based on DEMATEL techniques and taking into account the mutual relationship among the variables used independent variables in the model, variable rate assets and quick ratio have the highest impact on credit risk and variable ratio of bank debt to total debt of cooperation with the bank has the lowest impact on credit risk. Indeed, the ratio of return on assets is positively related with credit risk and the ratio of capital adequacy is negatively associated with credit risk. Then, the results indicate that the bank credit risk-taking decisions are also related to bank macroeconomic indicators.

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