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Investigating the Impact of Technical and Market Indicators on Collecting Isfahan's Sepah Bank Debts

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Abstract

Banking system in Iran in recent years faced an increasing growth in deferred debts; which one of most obvious effects of deferred debts outbreak is creating disruption in the correct and timely circulation money in the system and in fact creating disruption in the vital artery of bank which in case of continuity and largeness of debts, bank faces lack of cash in performing financial liabilities timely. Therefore, decision making towards giving loans and facilities, comprehensive investigation of applicants in order to minimize risk of not to repay is very important. The purpose of this study is studying and determining the relationship between measures of credential risk such as technical and market measures and recovery of Sepah bank's debts.

Each of these measures and their subsets in this study are introduced and the relationship and impact of each measure with/ on Sepah bank's debts in Isfahan district is determined and finally, the probability of recovery or inability to recovery debts prior to giving any loan or other facility to the applicant is determined and investigated. In this sense, credit information and information related to the credit files of Sepah Bank branches in Isfahan during 2006 to 2011 were used which have been selected randomly. The evaluation of hypotheses is performed through Pearson correlation coefficients and audit analysis method. Results show that credit status of borrower manufacturing companies can be investigated based on market and technical measures and customers can be classified from credit risk point of view based

on those measures. Also, regarding to achieved models which are significant statistically based on audit analysis and applying described technique, credit risk status of bank's juridical customers can be predicted or analyzed from economic and financial perspective before giving facilities and through which bank's deferred debts can be reduced.
Keywords : Risk , Credit risk, Risk Management, Facility Deadline, Overdue Debts, Bad debts, Technical Measures**.**

1.Introduction

Banking system in Iran like other countries has very important role in economy. Banks are cash intermediaries in money market and because of insufficient development of capital market they have basic role in financing of mid-term and long-term economic programs in the country. It is obvious that in that case, giving the facilities constitutes an important part of each bank's operations. Country's banking system in recent years has been faced with salient growth of deferred debts deadlines. Statistics show that rate of growth is still increasing. Based on regnant and overseer rules on country's banking system, the amount of debts of deferred deadline should not be more than 5% of overall residue of bank's facilities (Valinejad, 2001). Because otherwise the credit status of banks is considered as critical. Banks are trying to give facilities to customers who besides having low risk, can have adequate turnover with profit of those facilities. This will happen when banks are able to identify their credit customers and can predict their ability on complete and on time payback of liabilities. In the financial activities arena, risk is considered as one of key affective factors on financial institutes and banks. In fact, identifying and determining various types of risk in different part of financial activities have basic role in sustaining and retaining them.

2.The necessity of topic

Iran's banking system in recent years has been faced with increasing growth of deferred debts which one of most obvious effects of outbreak is creating disruption in the correct and timely circulation money in the system and in fact creating disruption in the vital artery of bank which in case of continuity and largeness of debts bank will face lack of cash in performing financial liabilities timely.

In such situation, the possibility of macro credit policy making has been faced with several problems and difficulties and finally will lead to chaos in credit planning, facility lending etc. Therefore, during decision making towards facility lending a comprehensive investigations of applicants in order to minimize the risk of failure to payback is very important (Rabie Zadeh, 2007). In every dynamic economic system especially banks, the correct and quick turnover of resources and consumptions presents favorable efficiency of executing methods and collecting lent facilities in defined time specifies the correct methods of applying resources in order to creating required facilities to develop economic activities and providing required resources for different sectors such as manufacturing, business and service and spending bank's resources. Prevention of creating debts in lent facilities or collecting them potentially increase the facilities of creating new revenues and heighten the ability of bank's planning in spending resources and gaining revenues (Latifi, 2004). The main problem and challenge which prompted the researcher is why deferred debts exist besides existing of several investigations and different filters and solutions that credit managers applied for customers.

Thus, new tools and methods should be applied rather than applying current methods by changing in the methods of execution and taking more adequate methods to ensure returning of resources and prevent banking resources to be more deferred. This requires change and creating right culture and demands new perspective on banking system in which banks

considered as an independence profit institute which away from instructions and implications can make decision along with its interests in the best way. Because without credit risk management there is no possibility for right controlling in order to prevent and reduce credit risk. In other words the purpose of credit risk management is controlling risk through acceptable parameters (Hany, 1999).

Measures such as manufacturing and financial measures previously studied by scholars and the extent of their relationship with collecting debts was determined. In this study measures such as technical and market measures are investigated. Technical measures include: a) technical capability and competency and b) technology and machinery. Also, market measures include a) sales feasibility and b) product characteristics. The extent of impact of each of these measures on collecting bank's debts is investigated completely. Regarding the importance of this issue and since the existence of banks' debts can create several problems for banking and economic system of community, so the necessity of investigating and identifying related measures in order to reduce or terminate their impacts seems to be inevitable. What is here important for banking system and accordingly for country, is that before lending facilities to customers, their power and ability to payback should be evaluated. In other words, credit risk related to each borrower before paying loan should be investigated and decisions should be made based on it. Therefore, investigation of relationship between credit risk measures and emergence of deferred debts is important for bank and identifying this relationship is basic factor in efficient lending facilities. Despite, applying new technologies (credit management) in countries such as credit risk, allocating risk to facility applicants in Iran is still doing on personal taste and without any evaluation so that in the context of lending to the customers there is no systematic procedure for determining credit risk and credit roof based on risk measures.

3. Concepts and definitions

Risk: risk is the possibility that predictions in the future aren't met (Hashemi nodehi, 1998).

Credit risk: lenders expect that the facilities or loans and their expected interests are paid timely but there is possibility that those expectations are not met. The possibility of this risk is called as credit risk (Mohammadi, 2001).

Risk management: it is a systematic way that identifies, analyses, measures, monitors and controls possible risks in different working ranges and reports them (Aslani, 1999).

Facility deadline: it is a defined date in which considered debt or liability is met (Mohammadi, 2001).

Overdue debts: it is that part of lent facilities that is past from original due date and facility interest more than two months or less than six months (Bahmani, 2007).

Past due debts: past due debts are facilities that their maturity date exceeds more than six months and bank takes legal actions to deal with them or will take in the future (Mohammadi, 2001).

Bad debts: all of original facility and its interest which exceed maturity date more than 18 months or its cut off payments date is overdue (Mohammadi, 2001).

Technical measures: measures that are bases for calculating, analyzing and studying companies' technical issues and criteria in order to technical part of juridical persons. Or in other words they are real and measurable companies' technical criteria which besides possibility of monitoring and assessing project they provide information about wide domain of conditions (Zonoorian, 2010).

Market measures: these measures are a criterion for market measuring juridical persons or in other words, they are real and measurable criteria which are basics for calculating,

analyzing and studying issues related to the companies' market which are used in order to assessing market situation, monitoring plans and their executable results, effectiveness evaluation and final results of a project (Zonoorian, 2010).

4.Background

Table 1. Summary of previous research

Researcher's name	year	Results
Mervin	1972	Selecting three ratios: current ratio, net circulating capital to sum of assets, capital to sum of debts in four to five years before stopping and outbreak bankruptcy are very important.
Smith and Victor	1928	Most accurate and most reliable ratio which unfavorable trend of it implicates on bankruptcy is circulating capital to asset volume
Balkaen an Og	2004	Using probability conditioning models in comparison to other methods has better results.
Min and Lee	2001	They used learning machine technique for predicting financial crisis
Aslani	2009	He extended results of Baradari and found that less bounced checks higher credit background and the extent of more capital rather than amount of facilities are among effective factors on reducing deferred debts
Ale Kasir	2005	Using of financial information by bank experts for evaluating investment projects has no relationship with facilities pay back
Zonoorian	2010	He classified the factors of creating and increasing the banks' deferred debts in three main category including, banks, debtors and external factors
Hasanzadeh and Habibi	2010	They found that preventing growth of deferred debts in lending facilities or collecting them potentially increase possibility of creating new revenues and planning power of these institutes.

5.Research methodology

5.1.Methodology

This study is applicable from the purpose and is descriptive field research from method of execution and is correlation type. This study was carried out in Sepah bank branches in Isfahan with the purpose of studying and determining the relationship between credit risk measures such as technical and market measures with collecting bank's debts. In order to do this credit information and information related to the credit files of Sepah Bank's branches where selected randomly during 2006 to 2011. In this research, samples are existing credit files in Sepah Bank's branches in Isfahan. Since, the objective of study determining the relationship between credit risk measures and emergence of deferred debts. In this research all of juridical customers who received deferred payment sale facilities and paid back them or not are defined as study samples. The number of available credit files is 198 which information of 175 of them finally were used as final sample using systematic elimination method and access to

the maximum real customer's information. In this study required literature was collected using library method. For collecting quantitative data, credit information and credit customers' form of Sepah Bank (file) and financial statements of manufacturing companies which benefit from payments based sales facilities were used. Financial information of selected samples is related to a financial period before time of borrowing the facility. Collecting data form consists of 31 questions based on four main dimensions which are responded by YES or NO.

5.2. Research Hypotheses

A.Study's main hypothesis

There is a significant relationship between credit risk measures and collecting deferred debts.

B.Lateral hypotheses

1. There is a significant relationship between sales feasibility measures (market) and collecting Sepah bank debts.
2. There is a significant relationship between product characteristics (market) and collecting Sepah bank debts.
3. There is a significant relationship between technical ability and competency measures (technical) and collecting Sepah bank debts.
4. There is a significant relationship between technology and machinery and collecting Sepah bank debts.

5.3. measures, items and model

In the current study, the way that manufacturing companies pay back their received deferred payment sale is dependent variable and two categories of credit measures such as technical and market solicited below are considered as independent or predictive variables.

1)Technical measures including: a) technical ability and competency including:

X1: Adequacy of activity location geographically, X2: easy access to initial resources, X3: existence of required work force, X4: ease of providing location of activity, X5: providing energy for company's activities, X6: appropriateness of weather for related activity, X7: Facilities and accommodations for personnel, X8: transportation facilities for manufactured product in the region, X9: existence of regional market for manufactured product.

b) Technology and machinery including:

X10: type of used technology in terms of traditional or modern, X11: the speed of technology change in the market, X12: nature of used technology, X13: the amount of capital that used technology needs, X14: adequacy of factory design, X15: the amount of coordination of nominal capacity with actual capacity of machinery, X16: existence of maintenance planning system.

2- Market measures including: a)Product characteristics including:

X17: is manufactured product monopoly? X18: is manufactured product complementary? X19: is manufactured product substitute? X20: is manufactured product strategic? X21: is manufactured product used for domestic use? X22: what is the extent of foreign dependency of manufactured product? X23: does manufactured product have quality standard? X24: is manufactured product under a credible company's license?

b)Sales feasibility including:

X25: the extent of using advertising and marketing experts in order to sell the product, X26: the amount of preselling of product for future, X27: restrictions on amount of sales of product, X28: the extent of restrictions on product price, X29: increase or reduction of sales comparing

to past, X30: the probability of reduction in product price comparing to the past, X31: the possibility of good export out of country.

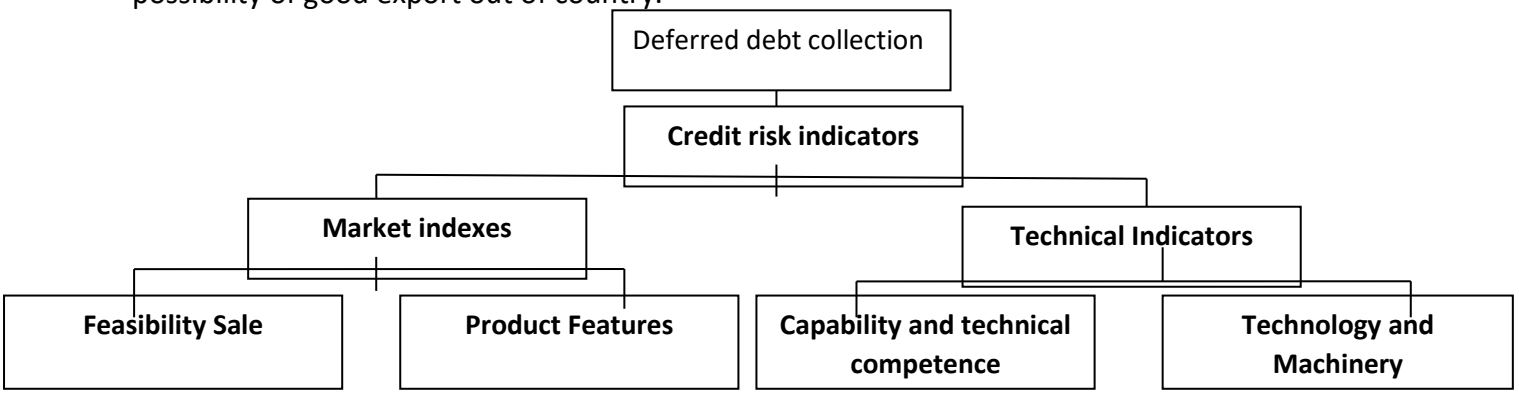

Figure 1. Research model (according to researcher's study).

5.4. Data analysis

In this research, in order to analyze collected data, descriptive statistics (frequency, measures of central tendency, scattering and mean) was used to describe the phenomena and prescriptive statistics including Pearson correlation test and Audit analyze model was used. Data analysis was carried out by SPSS, 19.

6.Descriptive Statistics

6.1.Descriptive Statistics: In descriptive analysis of data among 175 samples, 29.7% had deferred debts or in other words they were debtor customers and 70.3% paid back their debts on time. From table 2. We can say that, there is a significant mean difference between study variable in situations such as deferred debts and timely debts. In sum, the biggest difference was related to the means of technology and machinery in two situations.

Table 2. Statistical criteria of study variables

Variable	**Customer credit status**	**Average**	**Standard deviation**
Capability and technical competence(Technical)	Overdue receivables	4.55	1.18
	Demands on time	4.99	0.68
	Total	4.86	0.87
Technology and Machinery(Technical)	Overdue receivables	3.13	1.89
	Demands on time	4.69	1.29
	Total	4.23	1.65
Feasibility Sale(Market)	Overdue receivables	3.44	1.42
	Demands on time	3.76	1.94
	Total	3.66	1.80
Product Features(Market)	Overdue receivables	371	1.18
	Demands on time	4.06	1.32
	Total	3.96	1.28

In response to study questions, technical ability and competency has the biggest frequency, i.e. 82.3% of respondents believe that there is a regional market for manufactured product. The lowest part of respondents, i.e. 36% believe that providing location for activities is easily possible. In response to technology and machinery the biggest part, i.e. 80.6% believe that

applied technology is capital consuming. The lowest part i.e. 41.1% believe that there is a coordination between nominal capacity and potential capacity of machinery. In response to sales feasibility, the biggest part, i.e. 82.9% believe that exporting goods out of country is possible and there is a possibility for creating revenue. The smallest part, i.e. 37.1% believe that there is increase or decrease in sales comparing to past. In response to product characteristics, the biggest part (i.e. 82.3%) believe that manufactured product is strategic and the smallest part (i.e. 37.1%) believe that manufactured product is complementary.

6.2. Prescriptive statistics

6.2.1. Examining study's hypotheses using correlation test between study measures and customers' credits status

Pearson correlation coefficient and significance test were used in order to identify, determine and calculate the correlation between credit risk measures and credit status of customers. In this test H0: there is no correlation (correlation is 0) and H1: there is correlation (correlation is not 0) are tested between credit risk measures and credit status of customers. In table 3. Significance levels of correlation coefficients between sales feasibility, technology and machinery measures and credit status of customers is less than 5% which means there is an average and direct relationship between those measures and credit status of customers. The significant level of correlation coefficient between product characteristics and technical ability and competency measures and credit status of customers is not less than 5% which means there is no relationship between these measures and credit status of customers.

Table 3. Correlation coefficients between credit risk measures and credit status (n=175)

Indicators		**Spearman Correlation Coefficient**	**Significance level**	**Result**
Technical	Capability and technical competence	0.073	0.336	Rejection
	Technology and Machinery	0.467	0.000	Accept
Market	Feasibility Sale	0.256	0.001	Accept
	Product Features	0.112	0.1138	Rejection

6.2.2.Results of audit analysis test

Report of significance of mean differences: first, variables mean and standard deviation are investigated in two different groups separately. Because one of initial investigations which could be a reason to ability to separate groups from each other, is difference between variables' means. By comparing mean difference in two groups, variables that have biggest mean difference, have more contribution in distinction between groups. Report of means illustrated in table 2, descriptive statistics part. But, in table 4 the significance test for mean difference in two groups has been presented. As mentioned before, variables can have more contribution in distinction that their mean difference in two groups is high and significant. For doing this, it is sufficient to consider the significant level and amount of Wilks' Lambda for each variable. Variable that its significant level is less than error considered by researcher and its Wilks' Lambda is relative low, will have a role in distinction. The significant level of technical ability and competency and technology and machinery measures is less than 1% whereby, mean difference in two groups is significant. The significant level of product characteristics is

less than 10% which means mean difference in two groups for this variable is significant. But, significant level of sales feasibility is more than 5% and 10% which means mean difference for this variable in two groups is not significant. We can conclude that variable such as technical ability and competency and technology and machinery have the biggest contribution in distinction. Product characteristics has a low contribution in distinction and sales feasibility has no role in it.

Table 4. Mean difference significant test (n=175)

Indicators		**Landa Vyklz**	**F-statistic**	**Significant level**
Technical	Capability and technical competence	0.949	9.325	0.003
	Technology and Machinery	0.813	1.694	0.000
Market	Feasibility Sale	0.993	1.168	0.281
	Product Features	0.984	2.80	0.096

6.2.3.Report of significance test for multivariate normality

M Box test was used for testing multivariate normality of data. This test is based on similarity of covariance matrix determinants of two groups. In this test, F examines the significance of covariance matrix in two levels of dependent variable. The significance level less than 5% means data are not multivariate normal. If dependent variable are multivariate normal, each independent variable regardless of other variables, is normal. Regarding that achieving to this assumption is difficult, in audit analysis if n>30 we can assume that distribution is normal (Zargar, 2005). Regarding that the result of M Box test in table 5 we can say that, multivariate normality is not supported but according to the central limit proposition in statistics and sample size, data distribution is multivariate normal.

Table 5. Results of multivariate normality test

My box test	**F-statistic**	**Significant level**
78.42	25.72	0.000

6.2.4.Report of significance tests and statistical power of relationship

Chi square test assesses the significant difference between groups across predictor variables after illumination of impacts of each auditor function. Maximum number of functions which can be solicited is equal to dependent groups minus 1. Therefore, in this study, since there is two groups of dependent variable, we have only one auditor function. In table 6 the significance level of Chi square test is less than 5%, thus the existence of function is significant and shows the difference between groups in for predictor variables.

Table 6. Significance test of function

Landa Vyklz	**Chi-square**	**Degrees of freedom**	**Significant level**
0.689	64.03	2	0.000

6.2.5.Report of model selection based on eigenvalue and focal correlation

table 7 shows that what percent of change in dependent variable of credit status is because of changes in independent variables. That is, what is the percent of relationship between independent variables and dependent variable? For audit function, eigenvalue is 0.451 and focal correlation is 0.558. By calculating the focal correlation square for audit function we can say, 31.1% of comparing variety in differences between two groups is explained. It should be noted that in this research because we have one function (which is linear composition of independent variables), there is only one eigenvalue which 100% of variance is determined by that.

Table 7. Focal correlation, percent and variance and eigenvalue of determinant function

Canonical Correlation	**Percentage of variance**	**Special Value**
0.558	100	0.451

7.Report of standard coefficients for auditor function

Each auditor function may be named for determining that variable that has most relationship with that (variable that separately has role in distinction between groups). An audit function is named by investigating the size of standardized correlation for predictor variables in function and correlation coefficients between predictor variables in internal function of one group (coefficients in structure matrix). In table 8 for audit function the biggest correlation belongs to technology and machinery and lowest correlation belongs to sales feasibility. According to the standardized function and structural correlations, we name audit function technology and machinery function. In this sense, absolute value of standardized function coefficients is their power of separation to credit identifying of customers and variables which are not in the auditor function have lowest distinction power.

Table 8. Structure of standardized audit function

Indicators		**Standardized coefficients of the audit function**
Technical	Capability and technical competence	0.189
	Technology and Machinery	0.713
Market	Feasibility Sale	0.223
	Product Features	0.112

7.1.Report unstandardized coefficients for auditor function

table 9 shows the extent, role and the percent of distinction of independent variable in dependent variable and also simultaneous presence of all variables. Information of this table is used for writing auditor function. As mentioned because we have two groups of dependent variable, we have one function. Therefore:

Z=-2.204+ 1.063 (technology and machinery) - 0.626(sales feasibility).

Table 9. Structure of unstandardized auditor function

Variables	**Coefficients of the non-**standard **audit function**
Technology and Machinery	1.063
Feasibility Sale	-.626

Constant	-2.204

7.2. Report of centrality of two groups

according to our interpretation of audit function of timely debts group shows tendency to the highest scale. Regarding table 10, mean pattern for function is consistent with researcher's interpretation of function. In fact the value of function in the center of deferred debts group and timely debts shows the correctness of diagnostic results.

Table 10. function values in the center of groups

Customer credit status	**Diagnostic function**
Overdue receivables	-1.026
Demands on time	0.434

7.3.Report of success in prediction of group membership

In table 11 from report of group membership it can be seen that, these results makes determining the extent of prediction of group membership using one categorizing function possible for us. The main diagonal values show the number and percent of group membership. Here, from 52 cases in deferred group, 37 cases (71.2%) were predicted correctly and 28.8% were predicted incorrectly. In timely debts group from 123 cases, 110 cases (89.4%) were predicted correctly and 10.6% were predicted incorrectly. From total 175 samples 147 cases or 84% are categorized correctly.

Table 11. Results of group categorizing for analyzing audit

	Predict group membership		
Credit status	**Overdue receivables**	**Demands on time**	**Total**
Overdue receivables	37(71.2%)	15(28.8%)	52(100%)
Demands on time	13(10.6%)	110(89.4%)	123(100%)

8.Results

In comparison of study results with other studies in this context, we should say that unfortunately any similar study has not done. Therefore, we can say that results of this study largely are consistent with Baradari (2007) and in addition to that grouping of applicants and customers of bank's facility is significantly done with high probability, effective factors on deferred or timely debts are identified and used by bank. Also, our results relatively cover Hasanzadeh and Habibi (2010) study which in "scrutinizing the deferred debts and its preventing methods in country banking system" suggest that preventing deferred debts from growing in lending facilities or collecting them increase the facilities of creating new revenue and provide planning power of these institutes relating to resource consumption and gaining higher revenues. In the other hand, sever lack of cash which most of governmental, private, small, big, manufacturing, trading and service organizations suffer from that, has created a chain of debts and undue debts which result in recession and increase in bankruptcies. In a comparison we can say that in studies in and out of country the method of auditor analysis in grouping and determining group membership has specific application.

9.Implications

1- In order to increase profitability and reduce debts, we can establish an integrated risk management system which one of its modules is calculating credit risk based on credit ranking of customers. Definitely, by establishing that system and providing organizational culture in order to move towards new and scientific methods to evaluate customers we can take a step forward to meet mentioned goals.

2- Designing and determining of a complete model of calculation of credit risk based on customers ranking with presence all of credit risk measures in order to calculate all credit risks for all real and juridical persons regarding all contracts and customers' received facilities from bank.

3- We suggest that in designing similar models, the impact of external factors besides internal factors is discussed and proposed models are considered.

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