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INVESTIGATING THE RELATION BETWEEN COMPETITION IN THE PRODUCT MARKET AND CREDIT RISK OF THE LISTED COMPANIES IN TEHRAN STOCK EXCHANGE

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ABSTRACT
The purpose of this research is to examine the correlation among competition in the product market and credit risk of the listed companies in Tehran stock exchange. All listed companies in Tehran stock exchange were selected as statistical population of the research during 2008 to 2012 which finally 76 firms were picked up. In addition, number of active firms in an industry, size of firms in an industry, and credit risk were considered as independent and dependent variables of the study, respectively. Three control variables of financial leverage, age and return on assets are also applied. The findings suggested that there is a significant relation between number and size of active firms in an industry and credit risk of the listed companies in Tehran stock exchange.

Keywords: Competition in the Product Market; Credit Risk; Firm Size

INTRODUCTION
In economics, competition is done among vendors to achieve the goals such as growing interests, market share and sales volume through changing marketing elements: price, product, distribution and advertisement (Carona, 2007). Adam Smith in "wealth of nation" defined "competition" as allocation of productive resources to their most valuable applications (Nayama, 2006). Competitiveness is one of the most important concepts in the last two decades which has attracted the attention of many researchers, management investigators, economic and international business and there have been offered many definitions for it (Hey, 2011). On the other hand, credit risk is one formed by default/failure of parties, or generally, by "incidental credit". Historically, this risk usually is true for bonds, as lenders were worried about refunds of given loans to a borrower. For this reason, this risk is occasionally called "default risk" (Pir, 1993). Credit risk arises from the fact that contracting party can't/won't act to obligations of the contract. The impact of this risk will be measured through cash replacement cost caused by default of contracting party. Losses from credit risk may occur before real default of a contracting party. Generally, credit risk can be defined as possible loss caused by an incidental credit (Kazemi *et al.,* 2008). This occurrence comes to realize when the ability of a contracting party changed during implementing his/her obligations. Credit risk is one of the most risk factors in banks and financial institutions. The risk arises from this perspective that borrowers are unable to refund payment of their debts to banks (Abzari *et al.,* 2011). What we looking for in this research is investigation of the relation between competition on the product market and credit risk of the listed companies in Tehran stock exchange.

Research Background
Alimo (2012) investigated the relation between competition in the product market, corporate governance and cash policy of firms. He found out that cash value positively depended on good corporate governance, but just for firms which are active in high-competitive environment. He also showed that high available cash may lead to decreased performance of firms which compete in high-competitive industries, even though good corporate governance decreased the negative impact of cash on performance.

Chow *et al.,* (2013) examined the correlation among competition in the product market and corporate governance and concluded that firms of competitive industries or of poor market power may have weak corporate governance structure. They had also suggested corporate governance quality significantly impact on performance just when competition in product market is weak. Finally, they stated that competition is a control power on management formed by fear from dissolution.

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Gani *et al.,* (2013) in his research in China examined the relation among competition in the product market and financing method of the listed companies in China stock exchange. Their results demonstrated that there is a non-linear (parabolic or cubic) relation between competition in a market and financing methods which depends on three factors of industry type, firm size and a firm's growth opportunities.

Michley *et al.,* (2013) examined the relation among competition in the product market and agency conflict. They showed that competition in the product market would lower the agency cost. Firms which operate in low-competition industries have less efficiency than high-competitive firms. They also indicated that competition in the product market is an alternative for corporate governance mechanisms and low-competition firms possibly apply vigorous corporate governance to aligning managements' interests with other shareholders.

MATERIALS AND METHODS

Research Methodology

Research Hypotheses

- There is a significant relation between number of active firms in an industry and credit risk of the listed companies in Tehran stock exchange.

- There is a significant relation between size of active firms in an industry and credit risk of the listed companies in Tehran stock exchange.

The Research's Statistical Population

The studied statistical population includes listed companies in Tehran stock exchange during 2008 to 2012. The selected firms should have three following conditions:

1- They should be listed in Tehran stock exchange before 2008.

2- Their fiscal year ends in 19/3/

3- Their information should be available.

The Research's Statistical Sample

Statistical sample of this research includes 76 firms, regarding population volume and the following equation is used:

$$ n = \frac{N(Z_1 - \frac{a}{2})^2 \sigma^2}{(N+1)d^2 + (Z_1 - \frac{a}{2})^2 \sigma^2} $$

Z1: Confidence in 95% level

N: Population volume

d: Sampling error

ε^2: Population variance

Regression Model

$$ \text{Credit risk}_{it} = \delta_0 + \delta_1 \text{number of firms}_{it} + \delta_2 \text{Firm Age}_{it} + \delta_3 \text{Lev}_{it} + \delta_4 \text{ROA}_{it} + \varepsilon_{it} $$

$$ \text{Credit risk}_{it} = \delta_0 + \delta_1 \text{Firm Size}_{it} + \delta_2 \text{Firm Age}_{it} + \delta_3 \text{Lev}_{it} + \delta_4 \text{ROA}_{it} + \varepsilon_{it} $$

Credit risk$_{it}$: In this research, we use Logit model to measure this variable.

Number of firms$_{it}$: The number of active firms in an industry is calculated through natural logarithm of number of active firms in an industry. The greater the number of active firms in an industry, the companies faces more competition (Rostami *et al.,* 2013).

Firm age$_{it}$: Number of listed years in Tehran stock exchange (Khorrami, 2013).

Firm Size$_{it}$: Natural logarithm of book value of active firms' total assets (Rostami *et al.,* 2013).

Lev$_{it}$: It is calculated by total debt to total assets ratio (Yeganeh, 2008).

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ROAit: It is calculated by net income to total assets ratio (Heidari *et al.,* 2012).
Data Analysis Method
In this investigation, we firstly examine descriptive statistics of the research's variables based on index of dispersion and central indices. Kolmogorov-Smirnov (K-S) test is used to examine the normality of data; finally simple linear regression test is applied for examining the research's hypotheses.

RESULTS AND DISCUSSION
Results
Data Normality

Table 1-1: Kolmogorov-Smirnov test for examining data normality

Variables	Normal parameters		Maximum difference	Pos.	Neg.	z-value of kolmogorov-smirnov	Probability
	Mean	SD	Absolute Value				
Credit risk	0.392	0.514	0.114	0.247	-0.066	0.798	0.145
Number of active firms in an industry	1.405	0.349	0.075	0.361	-0.175	1.032	0.096
Size of active Firms in an Industry	21.473	3.258	0.169	0.224	-0.134	1.115	0.095
Firm age	7.24	0.281	0.244	0.132	-0.045	0.962	0.112
Financial Leverage	0.346	0.153	0.103	0.254	-0.096	0.847	0.164
Return on Assets	0.286	0.492	0.099	0.115	-0.162	1.332	0.081

* 5% error level

Regarding table 1-1, due to significance level of the variables is more than 0.05, H0 (normality of data) is confirmed for the variables of credit risk, number and size of active firms in an industry, firm age, financial leverage and ROA.
The First Hypothesis Test

Table 2-1: Regression

Variables 's name	Non-standardized estimated coefficients		Standardized estimated coefficients	t-statistics	Significance level
	Impact Factor	Estimation deviation			
Fixed	0.157	0.527	-	1.996	*0.012
Number of active Firms in an Industry	2.362	0.639	0.244	2.275	*0.000
Firm age	-0.047	0.245	-0.106	-2.015	*0.005
Financial leverage	5.227	0.199	0.196	1.862	*0.026
ROA	-1.106	0.378	-0.345	-2.369	*0.000

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Table 3-1: Description and significance ability of whole model

R Sig	F	DW	ANOVA Adjusted coefficient of determination	Coefficient of determination
0.000**	11.577	1.926	0.349	.357

Regarding the table 3-1, since Durbin-Watson statistic test value is determined among 1.5 to 2.5, there is no correlation between errors and regression can be used. The adjusted coefficient of determination is 0.349; indicating 34.9% of all credit risk changes depend on the independent variable. On the other hand, due to significance level of F-test (11.577) in error level less than 0.01, it can be concluded that the regression model is a suitable model and the independent variable are able to describe credit risk changes. Standardized impact factor of active firms' numbers in an industry on credit risk is 0.244, suggesting number of active firms' variable positively and directly impacts on credit risk. Also, due to significance level of t-statistics, number of active firms' in an industry on credit risk is 0.000, H0 is rejected in 5% error level with 95% confidence level. It can be stated that there is a significant relation between number of active firms' in an industry and credit risk of the listed companies in Tehran stock exchange. The general model of the research is:

$$\text{Credit risk}_{it} = 0.157 + 0.244 \text{ number of firms}_{it} - 0.106 \text{ Firm Age}_{it} + 0.196 \text{ Lev}_{it} - 0.345 \text{ ROA}_{it} + \varepsilon_{it}$$

The Second Hypothesis Test

Table 4-1: Regression

Variables 's name		Non-standardized estimated coefficients Impact Factor	Estimation deviation	Standardized estimated coefficients	t-statistics	Significance level
Fixed		0.196	0.379	-	2.114	*0.006
Industry		2.209	0.651	0.218	2.362	*0.000
Firm age		-0.175	0.526	-0.239	-1.962	*0.012
Financial	Leverage	4.349	0.296	0.175	1.856	*0.026
ROA		-2.349	0.522	-0.059	-2.069	*0.009

Table 5-1: Description and significance ability of whole model

R Sig	F	DW	ANOVA Adjusted coefficient of determination	Coefficient of determination
0.000**	10.962	1.672	0.328	0.334

Regarding the table 4-1, since Durbin-Watson statistic test value is determined among 1.5 to 2.5, there is no correlation between errors and regression can be used. The adjusted coefficient of determination is 0.328; indicating 32.8% of all credit risk changes depend on the independent variable. On the other hand, due to significance level of F-test (10.962) in error level less than 0.01, it can be concluded that the regression model is a suitable model and the independent variable are able to describe credit risk changes. Standardized impact factor of active firms' size in an industry on credit risk is 0.218, suggesting size of active firms' variable positively and directly impacts on credit risk. Also, due to significance level of t-statistics, number of active firms' in an industry on credit risk is 0.000, H0 is rejected in 5% error level

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with 95% confidence level. It can be stated that there is a significant relation between size of active firms' in an industry and credit risk of the listed companies in Tehran stock exchange. The general model of the research is:

$$\text{Credit risk}_{it} = 0.196 + 0.218 \, \text{Firm Size}_{it} - 0.239 \, \text{Firm Age}_{it} + 0.175 \, \text{Lev}_{it} - 0.059 \, \text{ROA}_{it} + \varepsilon_{it}$$

Conclusion and Suggestions

The result of the first hypothesis indicated that there is a significant relation between the numbers of active firms in an industry and credit risk of the listed companies in Tehran stock exchange. This result was consistent with the findings of Setayesh & Kagar (2011), Chow *et al.,* (2013), Ghorbani *et al.,* (2013), Heshmat *et al.,* (2013), Gani *et al.,* (2013) and was inconsistent with Gonzales (2007), Khadami and Barzaei (2013). The result of the second hypothesis suggested that there is a significant correlation among the size of active firms in an industry and credit risk of the listed companies in Tehran stock exchange. These findings were consistent with Ghorbani *et al.,* (2013), Ebrahimi and Darya (2012), Sun and Chang (2012), Chow *et al.,* (2013) and Michley *et al.,* (2013) and were inconsistent with the results of Pasiras (2010), Khosh and Shahiki (2012). Regarding to the impact of competition in the product market on firms' credit risks, it is recommended to investors to don't solely rely on firms profitability and focus on other factors such as place of that firm in the related industry, condition of that firm in the product market, market capability and firm's market share.

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