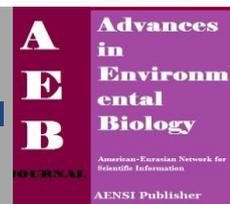




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The Impact of Product Market Competition on Earnings Quality in Listed Companies of Tehran Stock Exchange

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ABSTRACT

This research studies the effect of competition on the earning quality in the product market of accepted companies on Tehran's stock market. To this end, a sample of 112 accepted companies in Tehran's stock market was selected in a period of 5 years, 2008-2013 and the needed data for hypotheses tests were collected from their financial statements. Following previous researches of Cheng et-al (2013) to evaluate companies' competitive power, four factors, i.e. The industry's sell to overall sell proportion, the industry's profit to the company's profit, the industry's assets to the company's assets and industry's concentration, and for evaluating the quality of their profit, Jones (1995) modified model were used. The findings show that except the industry's profit to the company's profit factor, and other factors had a significant effect on the reported earning quality of the companies. This finding is in line with the previous research of Cheng et-al (2013).

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INTRODUCTION

The effect of business agencies' activities in today's business trend with the major challenges like globalization process, formation of world trade organization (WTO) and world markets' unity, rapid advances along with basic technological advances, new advances in case of IT, rapid changes in supply & demand patterns, setting controls for the environmental pollutions as well as saving energy resources, lack of sources and their high expenses are unquestionable [1]. Their survival totally depends on making accurate and on time decisions against these changes [2]. May be one of the most important economic issues in today's world is the issue of competitiveness and improving the situation of various industries for their survival in this competitive world [3]. Those companies with better adaptability in their marketing strategies are better able to survive in the dynamic global market, faster than their competitors can improve their competition advantage and save it [4]. In today's world, the best capability of every company is in being able to access accurate and valid information in the shortest time and through the most valid channels. Industrial and financial economists have been increasingly aware of the relationship between competition in the product market and companies' financial decisions (Gani and colleagues, Zoll).

Based on this, this research aims to study the relationship between competition in the product market and the earning quality in the accepted companies in Tehran's stock market. It is tried to answer this question that if improving the competition level in the product market of the accepted companies in Tehran, s stock market leads to the improvement of earning quality in these markets or not.

The Theoretical basis of the research:

In the empirical studies about the structure of market for judging of monopoly and competition level in every market, "concentration" concept is mostly used. Concentration is one of the important aspects in market's structure and maybe it is the most important structural variable. Market's concentration is a situation in which industry or market is controlled by few leading or big active producers in that industry. Herfindahl-Hirschman Index which is known as "complete information", because in forming this index the information of all agencies of the industry is considered, is the most suitable index for evaluating competition in the market. This index is the sum of square roots of all companies' sales in an industry.

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The more an industrial concentration is (less active companies in the industry or the major sales belong to one or some special companies), the biggest the Herfindahl-Hirschman Index and vice versa. As mentioned, it is generally considered that the industries with lower concentrations are more competitive than other ones.

The recent researches in economics show that production markets' competition has various aspects and is not just described by concentration proportion [5]. Raith in 2003 stated that, among the others, products' replacibility, market size and entrance expenses are the other aspects of products, market competition. If products' replacibility variable has been high, lower entrance expenses (the amount of investment on assets) makes the competition in products, market stronger. Furthermore, products' replacibility and market size affect the competition among current competitors in a special industry. That is, bigger markets, strengthens the competition among competitors to have more sales and competitive prices increase with the increase of products' replacibility (Salop, 1979).

A quick review over major researches done in this field:

To 1980, capitalism system governing world economy worked in economic Liberalism which was based on Adam Smith's ideology. In this system, competition among producers was the basis of market's function and all the efforts were in this trend. In this ideology, competition leads into functionality and market's flexibility. It is claimed that in this system, production factors' efficiency is improved. Management influence of competition can be implicitly found in Smith's famous work. In "Nations' wealth" book, Smith states "monopoly is the greatest enemy of good management that prevents a good management except through free competition" (Smith, 1970). From this belief, it can be known that through competition, economic agency's management will get better which leads into a more efficient production factors' chose along with a better combination. In the other words, with special number of agencies, more production occurs.

Brander & Lewis [6] studied the relationship between product markets and companies, financial decisions. Considering of multiple monopoly in market in which production and financial decision are made sequentially, they showed that limited responsibilities of every company may make the company to use more courageous policies to have better efficiency and because companies tend to influence production market by using their finance, it can provide a new index for determining finance-debt proportion. Darrough [7] in a research studied the effect of competition in market on the behavior of information providers about the finished prices of productions. He showed that in competitive situation and with higher products' replacibility, companies report of bad signs and news about finished prices more often. In higher competitions, prices, production amount and sales are determined by market if companies report of higher finished prices. It can encourage active companies to increase their prices in one hand and convince consumers about prices' increase in the other hand that leads to price increase and companies satisfaction in the end. Not only all active companies in the market try to sell their products with higher prices, but they also try to reduce prices to sell more to maximize the profits of their beneficiaries. In this way, the efforts are to show higher costs and reduce prices that decreases finished price-sale proportion. Therefore, it is expected that in competitive markets with higher products, replacibility, finished price-sale proportion will be lower than other markets.

Nickel [8] studied the functions of companies and their impressibility of competition. He studied the number of competitors and profit minus expenses to measure competition level using 170 British companies during 1972-86 and concluded that competition leads to higher growth of efficiency.

Clinch and Wickchilia [9] studied the relationship between market competition and information supply of market's demand size. They found out that companies try to neutralize good news and signalize bad news in which there is a direct relationship between these efforts and the level of competition. Because it reduces competitors' production and prices increase (reverse relationship of supply and demand). Not only signifying bad news leads into prices increase, but also hinders new competitors to enter the market, because in economics, production is not a tough work at all. In this end, product distribution and sell are more important than its production. If potential competitors understand the demand side better, they would try to enter the market which causes to higher demand. Zhang *et al*. [10] studied the effect of ownership and competition on efficiency (for agencies). The findings show that competition in export markets is directly related to efficiency, while there is no such a relationship in local markets. Janus & zewski *et al*. [11] assessed the effect of competition in product market on companies' function. They studied about 500 German industrial units during 1986-94 and concluded that those ones with higher efficiency growth work in more competitive markets. Penman & Zhang [12] in their study analyzed the effective factors on earning quality reduction after 1990. In this research, two factors, committed items and profit reaction coefficient, were used. The findings show that the significant increase of committed items' domain as well as the significant decrease of profit reaction coefficient indicate the reduction of earning quality in this period of time. Chan *et al*. [13] studied "the relationship between earning quality and share yield" during 1995-1971. The summary of research findings shows the relationship of lower level of earning quality with lower yield and vice versa. Saqhafi & Kordestani [14] studies the relationship between earning quality and market, s reaction toward cash profit changes. The findings showed that according to the earning quality based on profit stability, market's reaction toward the increase of companies' cash profit is

positive which was against the predictions. Also according to the earning quality based on profit relationship and operational cash trends, market's reaction toward the decrease of companies' cash profit was positive which had been predicted. Hou, k. and D.T. Robinson [15] used a sample of all accepted companies in New York's stock market and the U.S stock market as well as another sample increasingly all accepted companies in New York's stockmarket, the U.S stock market and the Association of Automatic financial intermediates, to study the effect of industrial concentration on share yield. They showed that even after size control, the proportion of noted value to market value and momentum, companies of competitive industries gain more share yield. They found out that the risk of innovation is a possible reason for this concentration. Dudu *et al* [16] studied the relationship between market concentration with profitability and functionality. Their findings showed that there is a direct relationship between competition and the function of agencies working in resourceful industries. Guney *et al*. [17] studied the relationship between competition in product market and the way Chinese stock companies provide their needed finance. They found out that the relationship between competition and providing finance is a linear one which depends on three factors of industry kind, company size and the opportunities for company growth. This researcher just like the other researchers considers competitiveness as efficiency.

Sharma [18] studied the relationship between share yield and three dimensions of product market competition during 1973-2006. His findings showed that considering market factors. Face value to market value, companies of concentrated industries gained lower yield. Furthermore, they found out that the companies with high product replacibility level gained balanced yield due to the higher risk taking behavior compared with companies with lower product replacibility level. Peter Cheng *et al*. [19] studied the relationship between competition in product market and earning quality. Their findings show that there is a positive relationship between competition in product market and earning quality. The findings also showed that there is a positive relationship between competition in product market and the accuracy of public as well as private information held by analysts and investors.

Research hypotheses:

According to the findings of Cheng *et al*. [19] on the significant relationship between competitiveness advantage in product market and their earning quality and to prove the research hypotheses, the following hypotheses were set and provided based on a theoretical basis:

H₁: competition power of the sample companies in product market based on companies' s sale compared to the whole industry' s sale, affects earning quality significantly.

H₂: competition power of the sample companies in product market, based on companies' profit compared to the whole industry' s profit affects earning quality significantly.

H₃: competition power of the sample companies in product market, based on companies' assets compared to the whole industry' s assets, affects earning quality significantly.

H₄: competition power of the sample companies in product market, based on industry, s concentration, affects their earning quality significantly.

MATERIALS AND METHOD

The present research is of correlational – descriptive type (in this type of research, researcher studies the relationship between and among two or more variables). In summary, the following steps have been taken in this methodology:

1. First, among the active companies in Tehran' s stock market, companies with the needed factors were selected.
2. Then, the needed financial data for performing provided models in this project with the referral to the relevant resources were collected.
3. After that, the needed indices like competitiveness of product market and earning quality were evaluated based on the research models.
4. And, through regression analysis, the model parameters were predicted and at the end, the predicted parameters try to approve or decline the hypotheses.

The data of this research are post-event ones and therefore, companies' historical information is used. Library technique is used to collect information and data. The statistical community of this research, based on the goal and conditions for its function, includes all the accepted companies in Tehran, s stock market and according to the goal of generalizing the finding, has been generalized to all the companies participated in this sample.

The suitable sampling technique for this research is systematic deletion. Due to the deletion of the effects of industrial inter mediatory variables, it is tried to use those industries for the purpose of sampling that have enough samples. In this end, the number of active companies in every industry must not be less than three. The sample also includes those companies that meet the following requirements:

- 1) To be accepted in Tehran's stock market to the end of B87:
 - 2) The end of their financial year be March 20 and be active in the stock market from 2007 to 2011:
 - 3) Availability of needed financial information for data mining:
 - 4) During research period, companies have not experienced any financial year change:
 - 5) Do not be leased by banks and financial institutions (leasing and holding companies)
- After deleting companies which did not meet the above mentioned requirements, 112 companies remained which were selected as the sample companies.

Research models and variables:

To test hypotheses, the variables of this research are classified into 3 classes of independent, dependent and control.

Independent variables:

In this study, the competition in product market was considered as the independent variables which can be measured through four indices, "company's sale to industry's sale", "company's profit to industry's profit", "company's assets to industry's assets" and "industry's concentration". The results of these indices will be the factors for companies' competition evaluation. Cheng *et al.* [19] research is used to measure the factors of competition power:

1. COMP (S): product market's competition power based on company's sale, I, to industry's sale, j, which is the result of company's sale to industry's sale division in which the company acts.
2. COMP (NI): Product market's competition power based on company's profit, I, to industry's profit, j, which is the result of company's profit to industry's profit division in which the company acts.
3. COMP (AS): Product market's competition power based on company's assets, I, to industry's assets, j, which is the result of company's assets to industry's assets division in which the company acts.
4. COMP (IND): Product market's completion power based on industry's concentration which can be given according to the Her final index of company's sale share root of industry's whole sale in which the company acts.

Dependent variables:

Earning quality was considered as dependent variable in this research which is measured by Jones (1995) Adjusted Model which is as follows:

$$TA_t/A_{t-1} = \alpha_1 \left[\frac{1}{A_{t-1}} \right] + \alpha_2 [(\Delta REV - \Delta REC)/A_{t-1}] + \alpha_3 [PPE_t/A_{t-1}] + \varepsilon$$

In which TA_t : all committed items of company in year t; A_{t-1} : sum of all assets of company in year t-1; ΔREV : Change in company's net income (between t-1 and t); ΔREC : Change in company's net accounts and received commercial documents (between t-1 and t); PPE : amount of assets, machineries and equipment of company in year t:

$\alpha_1, \alpha_2, \alpha_3$: special predicted parameters of company; ε : model's waste, in which: TA_t ; $NI_t - CFO_t$

NI_t : Net profit in year t; CFO_t : the net flow of operational cash in year t.

Note that in this model, the sum assets of company at the beginning of each period was used to standardize and harmonize parameters in order to reduce fluctuations. The above-mentioned regression model waste (ε), gives the amount of optional committed items. Because of the decrease of earning quality after the increase of optional committed items, square root of optional committed items is used as converted index of earning quality, i.e

$$EQ = \frac{1}{\varepsilon^2}$$

Control variables:

Control variables applied in this research include:

1. Size: size of company is the natural log of whole assets at the end of year:
2. MTB: market's value to company's value at the end of year:
3. NCI_j: number of industry, s companies at the end of year.

Applied model to analyze the relationship among research variables:

In this research, to test research hypotheses, i.e the impact of competition in product market on earning quality in Tehran stock market, regression models are estimated as follows:

$$EQ_{ij} = B_0 + B_1 COMP(S)_{ij} + B_2 SIZE_{ij} + B_3 MTB_{ij} + B_4 NCI_j + \varepsilon_{ij} \quad (1)$$

$$EQ_{ij} = B_0 + B_1 COMP(NI)_{ij} + B_2 SIZE_{ij} + B_3 MTB_{ij} + B_4 NCI_j + \varepsilon_{ij} \quad (2)$$

$$EQ_{ij} = B_0 + B_1 COMP(AS)_{ij} + B_2 SIZE_{ij} + B_3 MTB_{ij} + B_4 NCI_j + \varepsilon_{ij} \quad (3)$$

$$EQ_{ij} = B_0 + B_1 COMP(IND)_{ij} + B_2 SIZE_{ij} + B_3 MTB_{ij} + B_4 NCI_j + \varepsilon_{ij} \quad (4)$$

In which:

COMP(S)_{ij}: competition in product market based on company' s sale to industry' s sale:

COM(IN)_{ij}: competition in product market based on company' s profit to industry' s profit:

COMP(AS)_{ij}: competition in product market based on company' s assets to industry' s assets: and

COMP (IND)_{ij}: competition in product market based on industry' s concentration.

Note that before doing the above-mentioned hypotheses' tests. Jones adjusted model must be used first to obtain the amount of committed items which is considered as an index for earning quality

Hypotheses tests:

Before doing the tests, correlation – description statistic between the variables have been studied and then Limer & Hausman F tests have been done determine the most suitable regression model to test the variables.

An analysis over variables' descriptive statistics of all companies:

The statistics of all companies are given table 1. The coefficients of changes (standard deviation on mean division) of independent variables in research period are shown in table 1. Among the mentioned variables, the independent variable of industry concentration has the least dispersion and therefore, has the most stability while company' s profit considerably in terms of concentration in industry in the research period, but do differ considerably in case of profitability. It seems that industry concentrations are a better index for determining competition power in product market compared to three other indices. The result also show that the dependent variable of earning quality has more dispersion and therefore, is less stable in this period compared to the indices of determining competition power in product market (except the variable of company, s profit to industry, s profit). This finding reveals that the indices of determining competition power in product market must have a relative impact on earning quality in this period.

Table 1: descriptive statistics of research variables for all companies.

Index	Variables	no	mean	middle	Max.	Min.	Standard Deviation	Coefficient of changes
Company' s sale to industry' s sale		560	0/12	0/06	0/99	0/01	0/17	1.42
Company' s profit to industry' s profit		560	0/12	0/05	2/68	-1/81	0/35	2.92
Company' s assets to industry' s assets		560	0/12	0/06	0/90	0/01	0/17	1.42
Industry concentration		560	0/28	0/25	0/99	0/01	0/19	0.68
Company size		560	13/46	13/25	18/40	10/03	1/29	0.1
Market value to face value		560	1/28	1/50	17/65	-13/1	8/19	6.39
Earning quality		560	0/013	0/005	0/10	0/00	0/019	1.46
No. of companies in industry		560	10/09	10	15	4	3/48	0.34

RESULTS AND DISCUSSION

The result of testing first hypothesis:

H₁: competition power in product market of various industries impact significantly earning quality compared to company' s sale to industry' s sale. Before testing first hypothesis. Suitable pattern is selected for regression model. First, using Limer' s F test, combinational data model VS. Panel model is selected. The results are given in table3. Limer' s F statistical level was lower than a significant level, 5%, therefore combinational data model cannot be used for this purpose. Due to the choice of panel data model, Hausman test was done to choose the pattern of fixed affects VS. the pattern of accidental effects for the purpose of doing panel data regression model. Hausman statistical possibility is more than a significant level, 5%, therefore, there is not enough evidence to reject the pattern of accidental effects and use it to test first hypothesis.

Table 2: the results of Limer' s F test and Hausman test.

Model	$EQ_{ij} = B_0 + B_1 * COMPS_{ij} + B_2 * MTB_{ij} + B_3 * NCI_{it} + B_4 * SIZE_{ij} + \epsilon_{ij}$			
Result	Test type	Test statistical amount	Degree of freedom	Test' s statistical possibility
Panel	Limer' s F	2.009	(111 and 444)	0.0000
Result	Test type	Khido statistical amount	Khido degree of freedom	Test' s statistical possibility
Accidental effects	Hausman	0.8815	4	0.9272

Regression model of accidental panel effects (periodical) of the impact of company' s sale to industry' s sale on inverse index of earning quality in the research 5-year period for all companies is given in table 3.

The results of testing first hypothesis are shown in table 3 in which the effect company' s sale to industry' s sale on earning quality' s inverse index is negative. Therefore, the effect of company' s sale to industry' s sale on

earning quality is positive i.e. the companies with high competitive power in product market based on their sale proportion, have higher earning quality. This effect according to the regression coefficient in company' s sale to industry' s sale (-0.0222) is weak and based on t statistical possibility (0.0082) is significant. It shows that the proportion of company' s sale to industry' s sale impacts earning quality significantly. The other results show that the variable of company size impacts positively and significantly (0.0025) the inverse index of earning quality. It reveals that by increasing company size, earning quality decreases.

Table 3: regression model of the effect of company' s sale to industry' s sale on earning quality.

Variance inflation factor	T statistical possibility	T statistical amount	Regression coefficient	Index		
				Variables		
-	0/2167	-1/237	-0/0155	C fixed amount		
1/715	0/0082	-2/653	-0/0222	company' s sale to industry' s sale		
1/891	0/0174	2/386	0.0025	Company size		
1/006	0/1139	1/584	0/0001	Market value to face value		
1/353	0/4545	-0/7485	-0/0002	No. of industry' s companies		
Jarque-Bera possibility	Jarque-Bera statistics		Dorbin-Watson statistics	F statistical possibility	Adjusted determination coefficient	Determination coefficient
0/070	5/309		1/807	0/032	0/012	0/019

The results of F statistics which are lower than 0.05 show that generally, the model is significant. On the other hand, Dorbin-Watson statistic are 1.8.7. Because this amount is between max-and its difference of 4, does not suffer from self-correlation problem. Because variance inflation factor (VIF) for independent and control variables is lower than 5, it reveals that there is no linear connection between independent variable and dependent ones and therefore, the regression model will be a suitable tool to predict. Furthermore, the results of determining adjusted coefficient show that during the research period, only 0.012 of changes in the earning quality of companies was affected by the proportion of company' s sale to industry' s sale and control variables. The remained amounts of the regression model have Jarque-Berastatistics of 5.309 and Jarque-Bera statistical possibility bigger than 0.05 and equal to 0.070 that shows regression remains are normal. Because the impact of company' s sale to industry' s sale on earning quality (0.0082) in all companies, first hypothesis of the research is confirmed.

The results of testing the second hypothesis:

H₂: competition power in product market-based on company' s profit to industry' s profit affects earning quality significantly. Just like the first hypothesis, before testing the second one, an appropriate pattern must be selected for regression model. First, using Limer' s F test, combinational data model VS. Panel data model is selected. Limer' s F statistical possibility is lower than a significant level, 5%, therefore, to test the second hypothesis, using combinational data model is rejected. Due to panel data model selection, Hausman test was applied to select the pattern of fixed effects VS. The pattern of accidental effects pattern to do regression test on panel data.

Hausman statistical possibility is more than a significant level, 5T, therefore, there is not enough evidence to reject the pattern of accidental effects. In this end, accidental (periodical effects pattern is used. The results are given in table 4.

Table 4: Limer' s F test' s and Hausman test' s results.

Model	$EQ_{ij} = B_0 + B_1 * COMPS_{ij} + B_2 * MTB_{ij} + B_3 * NCI_{ij} + B_4 * SIZE_{ij} + \epsilon_{ij}$			
Result	Test type	Test statistical amount	Degree of freedom	Test' s statistical possibility
Panel	Limer' s F	2/115	(111 and 444)	0.0000
Result	Test type	Khido dtatistical amount	Khido degree of freedom	Test' s statistical possibility
Accidental effects	Hausman	3/88	4	0.4226

The panel regression model of accidental (periodical) effects compared to the effect of company' s profit to industry' s profit on the inverse index of earning quality in the 5-year research period for all companies is given in table 5.

The result of the second hypothesis are shown in table 5 that reveal the effect of company' s profit to industry' s profit on inverse index of earning quality is negative. Therefore, the effect of company' s profit to industry, s profit on earning quality is positive, i.e those companies with higher competition power in product market based on their net profit level, and have higher earning quality. This effects is weak (-0.0019) according to regression coefficient in company' s profit to industry, s profit and is not significant (0.4433) t statistical possibility. It reveals that the proportion of company' s profit to industry' s profit does not affect earning quality.

Table 5: regression model of the effect of company' s profit to industry' s profit on earning quality.

Variance inflation factor	T statistical possibility	T statistical amount	Regression coefficient	Index		
				Variables		
-	0/9928	-0/009	-0/0001	C fixed amount		
1/229	0/4432	-0/7674	-0/0019	company' s sale to industry' s sale		
1/239	0/2941	1/050	0.0009	Company size		
1/003	0/1358	1/494	0/0001	Market value to face value		
1/082	0/6651	0/4331	0/0001	No. of industry' s companies		
Jarque-Bera possibility	Jarque-Bera statistics		Dorbin-Watson statistics	F statistical possibility	Adjusted determination coefficient	Determination coefficient
0/096	4/692		1/806	0/3868	0/0003	0/007

The result of F statistics which are more than 0.05 shows that the model is not significant generally. Meanwhile, Dorbin-Watson statistical level is 1.807 and because this is between the max. And its difference at 4, this model does not have the problem of correlation. Because the amount of various inflation factor (VIF) for independent variable and control ones is lower than 5, it reveals that there is no (near connection between independent variable and dependent ones): therefore regression model is an appropriate tool for prediction. Furthermore, the results of adjusted determination coefficient reveal that during the research period, only 0.0003 of changes in earning quality of companies was influenced by the proportion of company' s profit to industry' s profit and control variables. The remained amounts for regression model have Jarque-Bera statistics equal to 4.692 and Jarque-Bera statistical possibility of 0.096 that shows regression remains are normal. Because the effect of company' s profit to industry' s profit on earning quality (0.4432) is not significant in all companies, the second hypothesis has not been confirmed.

The results of testing the third hypothesis:

H₃: competition power in product market of various industries based on the proportion of company' s assets to industry' s assets does not affect earning quality significantly. Before testing this hypothesis, an appropriate pattern must be selected for regression model. First, using Limer' s F test. Combinational data model VS. Panel data model is selected. The level of Limer' s F statistical possibility is lower than 5%: therefore, using combinational data model to test this hypothesis is rejected and because of choosing panel data model VS. Combinational data model, Hausman test was done to select the pattern of fixed effects VS. Accidental effects pattern to do panel data regression. The level of Hausman statistical possibility is more than 5%: therefore, there is not enough evidence to reject accidental effects pattern and it is used to test the first hypothesis. The results are shown in table 6.

Table 6: The results of Limer' s F and Hausman tests.

Model	$EQ_{ij} = B_0 + B_1 * COMPS_{ij} + B_2 * MTB_{ij} + B_3 * NCI_{ij} + B_4 * SIZE_{ij} + \epsilon_{ij}$			
Result	Test type	Test statistical amount	Degree of freedom	Test' s statistical possibility
Panel	Limer' s F	2/074	(111 and 444)	0.0000
Result	Test type	Khido dtatistical amount	Khido degree of freedom	Test' s statistical possibility
Accidental effects	Hausman	0/9903	4	0.9113

Regression model of accidental effects shows the effect of company' s assets to industry' s assets on the inverse index of earning quality in the 5-year research period in all companies which are given in table 7.

Table 7: regression model of the effect of company' s assets to industry' s assets on earning quality.

Variance inflation factor	T statistical possibility	T statistical amount	Regression coefficient	Index		
				Variables		
-	0/2391	-1/179	-0/0167	C fixed amount		
2/603	0/0418	-2/040	-0/0196	company' s sale to industry' s sale		
1/449	0/0369	2/092	0.0025	Company size		
1/004	0/1251	1/536	0/0001	Market value to face value		
1/474	0/5430	-0/6087	0/0002	No. of industry' s companies		
Jarque-Bera possibility	Jarque-Bera statistics		Dorbin-Watson statistics	F statistical possibility	Adjusted determination coefficient	Determination coefficient
0/117	4/284		1/81	0/102	0/0067	0/0138

The results of the H₃ test are given in table 7 that show the effect of company' s assets to industry' s assets on the inverse index of earning quality which is negative. Therefore, the effect of company' s assets to industry' s assets on earning quality is positive, i.e those companies with high competition power in product market based on their assets level, and have higher earning quality. This effect is weak (-0.0196) according to the regression

coefficient of company's assets to industry's assets which is significant (0.0418) t statistical possibility. It results that the effect of company's assets to industry's assets on earning quality is significant. Other results show that the variable of company size has significant and positive effect (0.0025) on the inverse index of earning quality. It reveals that increasing company's size decreases earning quality. The results of F statistics which are more than 0.05 show that model is not significant in the general position. Meanwhile, Durbin-Watson statistical level equals 1.81 and because this level is between Max. and its difference in 4, this model does not have the problem of correlation ship. Because the amount of variance inflation factor (VIF) for independent variable and control variables is lower than 5, it results that there is no linear connection between independent variable and dependent ones; therefore, this regression model is an appropriate tool for prediction.

Furthermore, the results of adjusted determination coefficient reveal that in the period of research, only 0.0067 of changes in earning quality of company was affected by company's assets to industry's assets and control variables. Remained amounts of this regression model have Jarque-Bera statistics equal to 4.284 and Jarque-Bera statistical possibility of 0.117 that shows regression remains are normal. Because the effect of company's assets to industry's assets on earning quality (0.0418) in all companies is significant, the third hypothesis of the research has been confirmed.

The results of testing the fourth hypothesis:

H₄: Competition power in product market of various industries based on industry concentration affects earning quality significantly. Before testing this hypothesis, an appropriate pattern was selected for regression model. First, using Limer's F test, combinational data model VS. panel data model was selected. The level of Limer's F statistical possibility was lower than 5%, therefore using combinational data model to test this hypothesis is rejected. Due to using panel data model VS. combinational data model, Hausman test was used to select the fixed effects pattern VS. Accidental effects pattern in order to do panel data regression. The level of Hausman statistical possibility is more than 5%, therefore, there is not enough evidence to reject accidental effects pattern and is used to test hypothesis one. The results are given in table 8.

Table 8: The results of Limer's F test and Hausman test.

Model		EQ _{ij} = B ₀ + B ₁ *COMPS _{ij} + B ₂ *MTB _{ij} + B ₃ *NCL _{it} + B ₄ *SIZE _{ij} + ε _{ij}		
Result	Test type	Test statistical amount	Degree of freedom	Test's statistical possibility
Panel	Limer's F	1/9421	(111 and 444)	0.0000
Result	Test type	Khido dtistical amount	Khido degree of freedom	Test's statistical possibility
Accidental effects	Hausman	0/3506	4	0.9863

The regression model of accidental effects of industry concentration effect on inverse index of earning quality in the 5-year period of research for all companies is given in table 9.

Table 9: Regression model of the effect of industry concentration on earning quality.

Variance inflation factor	T statistical possibility	T statistical amount	Regression coefficient	Index Variables		
-	0/1841	-1/33	-0/0155	C fixed amount		
1/981	0/0006	-3/443	-0/0245	company's sale to industry's sale		
1/834	0/0042	2/8729	0.0029	Company size		
1/006	0/1109	1/597	0/0001	Market value to face value		
1/374	0/2491	-1/154	-0/0003	No. of industry's companies		
Jarque-Bera possibility	Jarque-Bera statistics	Dorbin-Watson statistics	F statistical possibility	Adjusted determination coefficient	Determination coefficient	
0/069	5/314	1/803	0/004	0/0202	0/027	

The results of H₄ in table 9 reveal that the effect of industry concentration on reverse index of earning quality is negative. Therefore, industry concentration affects earning quality possibility, i.e. the companies with high competition power in product market based on concentration level in product market based on concentration level in industry, have higher earning quality. This effect is weak according to regression coefficient of industry concentration (-0.0245) and significant according to t statistical possibility (0.0006). It shows that industry concentration affects earning quality significantly. Other results show that company size affects the inverse index of earning quality both positively and significantly (0.0042). It reveals that the bigger the companies, the lower the earning quality. The results of F statistical model, which is lower than 0.05, show that in general situation, model is significant. Furthermore, the level of Durbin-Watson statistical model is 1.803 and because this level is between Max. level and its difference that says this model does not have the problem of correlation ship. Because the amount of variance inflation factor (VIF) for independent factor and control factors is lower than 5, it reveals that there is no linear connection between independent variable and dependent ones; therefore, this regression model is an appropriate tool for the purpose of prediction. Furthermore, the

results of adjusted determination coefficient show that during the research period, only 0.0202 of all changes in earning quality of companies was affected by industry concentration and control variables as well. The remains of regression model have 5.314 Jarque-Bera statistical levels and 0.069 Jarque-Bera statistical level that show the regression remains are normal. Due to the significance of the effect of industry concentration on earning quality (0.0006) in all companies, H_4 has been confirmed.

Conclusions:

The results of the research hypotheses:

The hypothesis of this research are about to say if there is a significant and positive relationship between competition power in product market and earning quality or not. To test this hypothesis, regression model of panel accidental effects was used based on Limer's F and Hausman tests. The results are given in table 10 briefly.

Table 10: Summary of research results.

Result of hypothesis	Significant or not	Kind of relationship	The result of hypothesis	No
Confirmed	Significant	positive	Competition power in product market of various industries based on the proportion of company's sale to industry's sale and earning quality.	1
Confirmed	NotSignificant	positive	Competition power in product market of various industries based on the proportion of company's profit to industry's profit and earning quality.	2
rejected	Significant	positive	Competition power in product market of various industries based on the proportion of company's assets to industry's assets and earning quality.	3
Confirmed	Significant	positive	Competition power in product market of various industries based on industry concentration and earning quality	4

To interpret the results, it can be said that the reason of company's profit to industry's profit not affecting earning quality is that companies' profit to industry's profit not affecting. Earning quality is that companies' profit are managed and manipulated which makes them inappropriate to determine competition power of companies. On the other hand, companies' high profit does not mean their earning quality is high and this is why this factor does not affect earning quality. Meanwhile, other factors such as sale proportion, the proportion of industry's assets and concentration are incremental which makes them less opted to be manipulated; therefore, it is an appropriate factor to determine competition power of company in market and affects earning quality as well.

Recommendations based on the results of the hypotheses:

according to the results, it was determined that there is a positive and significant relationship between the proportion of company's sale to industry's sale, company's assets to industry's assets and industry concentration to earning quality. On the other hand, company's profit to industry's profit does not affect earning quality significantly. Therefore, the following recommendations are given:

1) In investment viewpoint, low earning quality is not appropriate because it shows risk possibility in resource allocation in that part which leads to slow economic growth through incorrect resource allocation. On the other hand, low earning quality deviates resource allocation from real efficient plans which leads to economic growth decrease. It seems that earning quality increase ensures investors about reporting company's information. Due to this insurance, there would be more investment in company and loads are paid easily and with lower rates; furthermore, investors would be satisfied with lower yields. Therefore, the cost of company's investment decreases and consequently there would be more financial resources available for company. Using input investment, companies would increase their output to gain more share in product market. Finally, due to higher market share, company's competition power increases.

2) Maybe, one of the techniques to ease the problem of investment to provide finance and invest companies with higher competition power is to inform accurately about their financial position and operational results other fore, the higher the competition, the more the company is willing to disclose its information which leads to the increase of reported earning quality.

3) Earning quality increase can help crystallize investment market. It will make finance market more efficient in terms of information and better improved in terms of resource allocation.

In other words, higher earning quality can increase the proportion of company, s assets to industry, s assets through using more investment in company and using borrowings to crystallize profit more and allocating theses resources for buying and building assets.

Topic recommendations for future researches:

For future researches, the following recommendations are provided:

- Due to using Jones adjusted model in this research to calculate the managed components of committed items as applied earning quality factors, in future researches it is recommended to apply other models for predicting earning quality.
- To measure competition level in product market, other indices like Lerner index and the economic indices can also be used and the results of using these indices can be compared.
- An analysis over the relationship of competition power in product market and earning quality for Tehran's extra-stock market companies.
- An analysis over the impact of competition in product market profit smoothing.
- An analysis over the impact of competition in product market on the quality of financial reporting.

Research limitations:

There was no significant limitation affecting the results of this research

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