

## The investigation of the relationship between financial competition and restrictions in companies accepted in Tehran Stock Exchange

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**Abstract:** This research aims to study the relationship between financial competition and restrictions in companies accepted in Tehran Stock Exchange. This study is an applied research regarding objective and it is correlation regarding data collection method. Data collected through observing financial statement and reports of attached financial statement of office database and other companies and Stock exchange Organization and investigating wide articles and research background in this field. This research's results showed that there is a positive and significant relationship between Herfindahl-Hirschman index regarding coefficient (0.088) and significance level (0.002) and financial restrictions, but there is a negative and significant relationship between two other competition indexes in this research including Concentration Competition and Tobin's Q Competition performance with coefficients (-0.114) and (-0.128) and significance level (0.000) with companies' financial restrictions, respectively.

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**Keywords:** Herfindahl-Hirschman Competition index, Tobin's Q Competition, Financial Restriction.

### Introduction

Competition has been necessary for dynamism of economic and it is known as an essential element for proper function of economic and industry which leads to increase in variety, selection freedom, employment and welfare of consumers, in addition to provide massive economic gains, including economic development, increasing efficiency, reducing production costs and developing partnerships. Therefore, many countries pursue their development path through competition development. Understanding the market and competition in markets is important for companies to advance their macro strategies because it helps structural increases in companies' power and prevents monopolism of companies in industry. In fact, competition indicates that existence of monopoly or market power can be attributed to market's structural factors such as barriers to entry, economies scale, difference in good and high concentration or market's behavioral aspect. Of course, evaluating industrial markets and assessment of effective behavioral and structural elements in monopoly formation plays a fundamental role in organizing market and developing competitive policies. In the other words, development of appropriate competitive and anti-monopoly policies will be possible through identifying market power and its main resources.

### Research literature

Brini and Montagnoli (2017) conducted a research entitles "financial competition and restrictions: two-sided story" regarding 27 South-East

Asian developing countries. In this research, competition was considered and studied as an independent variable through Herfindahl-Hirschman index as factor influences companies' inability for external financing. The results showed that larger industries will be involved in financial constraints due to more intense competition and this issue can be because of size of companies and their financial restrictions for external financing.

In a research entitled "sensitivity of cash maintenance to cash flows, Bow and Chan (2016) studied the relationship between positive or negative cash flows' effects on level of cash flow maintenance by companies. The results of their research showed that where a commercial unit has positive cash flows, it will have less willingness to cash and it will show more tendencies to cash maintenance when it has negative cash flow.

In a research entitled "sensitivity of cash external financing to operational cash flows at financial restrictions condition, Garcia and Sogurbe (2015) studied the relationship between operational cash flow and external financing. This research's results showed that the companies with financial restrictions pay more attention to Hierarchy Theory in financing resources selection compared with those with less financial restrictions. This study's findings also show that there is a negative relationship between operational cash flow and external financial both in limited companies and in companies with no financial constraints.

In a research, Khodada Kashi et al (2016) studied the size of competition, monopoly and behavior pattern in the Iranian industry using a non-structural approach. According to research's results, a high percentage of Iranian industry has had average concentration and the size of entry barriers is also very high for a significant percentage of industries. On the other hand, Iran's industry has not enjoyed economies scale and furthermore, the results of the research using the Panzer- Rosse approach indicate that the Iran's industrial markets are not also competitive.

Shahikitash and Noruzi (2015) investigated structure of Iran's factorial industry market based on structural and non-structural models in 131 industries with four- digits ISCI code of Iran in the years 1996 to 2008. With respect to value of indexes Bon (-0.12), Herfindahl- Hirschman (0.24) and Lerner (0.36), they found that the level of competition in Iran's industry sector has been low and the country's industry operates under exclusive competition conditions.

Ali Nejad Sarokkalei and Ain (2014) studied the effect of turnover of capital respecting financing restrictions on cash flow sensitivity. The research's results showed that among capital in turnover management criteria, only the effect of receivables collection period on sensitivity of cash flow due to financial restriction is positive and significant. But the effect of creditors' deposit period, inventory turnover period and cycle of turning cash on cash flow sensitivity is not significant due to financial restrictions.

### Research's hypotheses

#### The main research hypothesis

There is a significant relationship between competition and financial restriction in companies accepted in Tehran Stock Exchange.

#### The secondary hypothesis

There is a significant relationship between Tobin-Q index and financial restriction in companies accepted in Tehran Stock Exchange.

There is a significant relationship between Herfindahl- Hirschman and financial restriction in companies accepted in Tehran Stock Exchange.

There is a significant relationship between ration of enterprise concentration and financial restriction in companies accepted in Tehran Stock Exchange.

$$\text{Tobin - Q} = \frac{\text{Total debt to book value} + \text{total stock to market value}}{\text{Total assets to book value}}$$

In the market with full competition, Tobin-Q ration of all the companies will be equal to 1. It is predicted that the competitive advantage of the companies whose Tobin-q ration is more than 1 will be reduced. It means that however this index is more;

### Operational definitions of research' variables

#### Independent variable

##### Competition

Competitions are always a difficult task in companies' today ever-changing environment and the companies which properly understand the market and industry's economic environment and try to gain more market share by concentrating on competition can achieve this important issue (Gani et al, 2011: 41).

Three indexes including Herfindahl- Hirschman (HHI), Tobin-Q and Concentration ratio will be used in this research in order to assess the intense or level of company competition in an industry

##### Herfindahl- Hirschman Index (HHI)

This index is obtained through the sum of square of market share of all the active enterprises in industry:

$$HHI = \sum_{i=1}^k S_i^2$$

K= the number of active enterprises in the market

S<sub>i</sub>= market share of company<sub>i</sub>

In which, S<sub>i</sub> is obtained through the following relations:

$$S_i = \frac{X_j}{\sum_{i=1}^n X_j}$$

X<sub>j</sub>= Sale of company<sub>j</sub>

I= Type of industry

Herfindahl- Hirschman Index measures the level of industry concentration. In this index, if the computed index for company is more, it means that however concentration level is high; the company will have less competition in considered industry (Hung & Lee, 2013:328)

##### Concentration Ration Index (CR<sub>n</sub>)

This index is defined as follows:

$$CR_n = \sum_{i=1}^n S_i$$

i = 1, ..., K

K > N

K= the number of active enterprises in the market

N= the number of large enterprises

S<sub>i</sub>= market share of enterprise<sub>i</sub>

Simple Tobin-Q index

it will indicate more concentration and less competition in industry and vice-versa.

#### Dependent variable

##### Financial restrictions

We use Kaplan N. Steven and Zingales Luigi (1997: 169-215) model in order to measure financial

restrictions. This model has computed coefficients which are possible coefficients and it is called KZ

index. The obtained coefficients are as follow:

$$KZ = -1.002 \frac{CF_{it}}{A_{it-1}} - 39.368 \frac{Div_{it}}{A_{it-1}} - 1.315 \frac{C_{it}}{A_{it-1}} + 3.139 Lev_{it} + 0.283 Q_{it}$$

This model's variables are calculated through below relations:

$$Q_{it} = \frac{\text{Book value of stockholders' salary} + \text{market value of stockholders' salary}}{\text{Book value of total assets}}$$

$$Lev_{it} = \frac{\text{book value of debts}}{\text{book value of assets}}$$

$$\frac{CF_{it}}{A_{it-1}} = \frac{\text{cash flow in year t}}{\text{total assets value at the begininig of year}}$$

$$\frac{Div_{it}}{A_{it-1}} = \frac{\text{the amount of profit division in year t}}{\text{total assets value at the begininig of year}}$$

$$\frac{C_{it}}{A_{it-1}} = \frac{\text{cash in year t}}{\text{total assets value at the begininig of year}}$$

**Monitoring variables**

**Sale growth**

Mires (1997, 147-157) analyzed the effect of factors which are created as the results of debt on optimal investment strategy of stockholders and managers.

$$GS_t = \frac{SALE_t}{SALE_{t-1}}$$

SALE<sub>t</sub>= sale in year t

SALE<sub>t-1</sub>= sale in year t+1

- Company's market value at the end of period

It is obtained through multiplying the number of share at stock price at the end of period.

$$MV = \frac{\text{number of stock}}{\text{share price at the end of period}}$$

**Research methodology**

This is an applied research regarding objective. Since this study is an applied kind of research regarding objective, it is correlation type in term of data collection.

**Statistical population**

All the companies have been divided into 28 industries in order to more accurately examine the information of companies accepted at Tehran Stock Exchange and 94 companies have been selected for model estimation and research's hypotheses test because the selected samples were not random and they also have more reliance capability by applying certain condition.

**Data analysis methods and tools**

In this research, the findings and hypotheses test will be analyzed by software Excel, Eviews8 following implementing library and field research stage and extracting enough information from samples and computing values of each one of variables. One-variable and multi-variable regression will be used to test hypotheses. One-variable regression is done by using cross-sectional and cumulative data.

**Research's findings**

**Descriptive statistics**

Descriptive statistics related to research's variables have been offered in table 2. Offered results provide a general schema of research's data condition.

**Table 2- Research's descriptive statistics**

Variables	average	median	Maximum	Minimum	Standard deviation	Skewness	stress
Financial restriction	1.19	0.94	8.48	-5.49	1.042	-1.48	13.174
Herfindahl-Hirschman Competition index	0.534	0.356	1.003	0.800	0.296	-0.163	-1.208
Concentration competition index	0.058	0.403	0.555	0.00	0.072	2.923	12.169
Tobin's Q index	1.632	1.524	73.583	1.267	3.472	10.706	10.211
Company's sale growth	2.48	2.312	510.121	-53.218	8.84	97.24	619.113
Company's market value	0.973	0.678	0.962	8.316	0.028	2.883	12.137

Financial restriction’s descriptive statistics show that this variable’s average is equal to 1.19 and its median is equal to 0.94 and according to its standard deviation which is equal to 1.042, descriptive statistics of HHI competition index shows that this variable’s average is equal to 0.534 and its median is equal to 0.563. It can be stated that dispersion around the average for this variable is normal.

We can conclude that there is an average dispersion in all variables that this issue can be

deduced from standard deviation. We can conclude that variable is not symmetrical or not from average median and all variables have relative symmetry.

-Evaluation of research’s variables reliability

According to reliability definition, a time series is reliable when its average, variance, co-variance and consequently correlation coefficient remain constant over time and period of time of these indexes calculation does not matter.

**Table number 3- Results of generalized Dickey Fuller Unit Root for research variables**

Variable	Test statistic value	Error level	Reliability degree
Financial restriction	562.19	0.000	I (0)
Herfindahl- Hirschman Index	473.3	0.000	I (0)
Focus competition index	512.51	0.000	I (0)
Tobin-Q index	1173.58	0.000	I (0)
Company’s sale growth	449.07	0.000	I (0)
Company’s market value	524.27	0.000	I (0)

**Research’s hypotheses test**

**The first hypothesis test**

This hypothesis aims to study this issue that is there a significant relationship between Herfindahl-

Hirschman Index and financial restriction or not. The following model is offered to assess this hypothesis:

$$KZ_{it} = \alpha_0 + \alpha_1 HHI_{it} + \alpha_2 GS_{it} + \alpha_3 MV_{it} + \varepsilon_{it}$$

**Table 4: Chow test’s results**

Chow f statistic	Significance level	Obtained result
9.67	0.000	Panel data

According to obtained results from Chow test at error level of 5 percentage and panel data method selection, it is necessary to use also Housman test in

continue in order to determine the type of applied panel data method (fixed or random effects) whose results have been offered in continue.

**Table 5- Housman test results**

Housman statistic	Significance level	Obtained results
67.39	0.000	Fixed effects

The obtained final result at error level of 5% for both two models shows that the used method for models estimation is panel data method with fixed

effects. Now, the results of research’s models estimation regarding the mentioned method have been presented in continue.

**Table 6- The results of the first hypothesis model estimation**

Dependent variable: financial restrictions	Dependent variable symbol	Z	Confidence level	95%	
variable	symbol	coefficient	Standard error	Statistic t	Significance
Width from origin	C	0.18	0.066	2.704	0.007
Herfindahl- Hirschman Index	HHI	0.088	0.045	2.92	0.002
Company sale growth	GS	-0.015	2.79	-0.002	0.015
Company market value	MV	-0.044	0.021	-1.75	0.081
F-statistic (Fisher) (significance)		20.76	0.000	Dependent variable’s standard DEVIATION	0.917
Adjusted determination coefficient	0.699	Dependent variable’s average			0.219
Watson Durbin statistic	1.67				
observations	658				

**Examining model presumptions**

At the next stage, regression model’s presumptions including coherent test among independent variables and first-order non-correlation test between error sentences and test’s results will be accepted in the case of appropriateness.

**Coherent among independent variables**

If VIF test statistic is close to 1, in indicates absence of coherent. Is VIF value is more than 10 as an experimental rule, multiple coherent will be high. According to obtained results regarding VIF value, we can state that there is no coherent among research’s independent variables.

**Lack of self-correlation test**

**Table 7- The results of self-correlation test**

Durbin-Watson statistic	result
1.67	There is no first-time correlation between error sentences

There are several test models in order to study the existence of self-correlation among error sentences from which Durbin-Watson test is the most common. The computed D\_W value is among 0 to 4; if this

statistic is estimated for a model around 2 (between 1 and 3 and in the stricter mode, between 1.5 and 2.5), it indicates that there is no self-correlation in the model.

**The first hypothesis’s result analysis**

**F-statistic (Fisher)**

The results of table with zero significance level (below 5%) indicate rejection of null hypothesis with 95% confidence. In the other word, there is totally a significant linear between dependent and independent variables and model enjoys the required validity for results analysis.

**Balance**

Determination coefficient level indicates a percentage of dependent variable changes which has been explained by model’s independent variables. Determination coefficient model is equal to 0.699.

**Hypothesis result analysis**

Models estimation shows that coefficient and error level of Herfindahl- Hirschman Index variable has respectively been equal to 0.002 and 0.088 which indicates the existence of positive and significant relationship of this variable with financial restrictions. Therefore, there is no evidence to reject this hypothesis and this hypothesis is confirmed.

**Table 8- Summary of research’s hypotheses results**

Hypothesis	Result
The first hypothesis- there is a significant relationship between Herfindahl- Hirschman Index and financial restrictions	According to statistical analyses, we should state that Durbin-Watson statistic is equal to 1.67. And also according to F-statistic (Fisher), it was determined that there is a significant linear relationship between dependent and independent variables and the model enjoys required validity for result analysis. Finally, models estimations shows that coefficient and error level of Herfindahl- Hirschman Index variable is respectively equal to 0.002 and 0.088 which indicates a positive and significant relationship between this variable and financial restriction. Therefore, there is no evidence to reject this hypothesis and this hypothesis is confirmed.
The second hypothesis- there is a significant relationship between ration of enterprise’s concentration and financial restrictions	According to statistical analysis, we should state that Durbin-Watson statistic is equal to 1.89. And also according to F-statistic (Fisher), it was determined that there is a significant linear relationship between dependent and independent variables and the model enjoys required validity for result analysis. Finally, models estimations shows that coefficient and error level of competition concentration variable is respectively equal to -0.114 and 0.000 which indicates a negative and significant relationship between this variable and financial restriction. Therefore, there is no evidence to reject this hypothesis and this hypothesis is confirmed.
The third hypothesis- there is a significant relationship between Tobin-Q index and financial restrictions	According to statistical analysis, we should state that Durbin-Watson statistic is equal to 1.65. And also according to F-statistic (Fisher), it was determined that there is a significant linear relationship between dependent and independent variables and the model enjoys required validity for result analysis. Finally, models estimations shows that coefficient and error level of Tobi-Q index variable is respectively equal to -0.128 and 0.000 which indicates a negative and significant relationship between this variable and financial restriction. Therefore, there is no evidence to reject this hypothesis and this hypothesis is confirmed.

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