Investigating the Effect of Financial Crisis Severity on the Relationship between Competitiveness and Profitability in the Product Market

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Abstract

This paper aims to examine the effect of financial crisis severity on the relationship between profitability and competitiveness of the market in the listed firms on Tehran Stock Exchange. For this purpose, competitiveness is evaluated in the market with special emphasis on the market share and financial crisis severity, as a continuous variable of the financial crisis and economic instability in the country, is assessed with special emphasis on the inflation rate. The study sample consists of 137 firms from 2013-2017. Regression model is used for testing the hypotheses. Results showed that the effect of profitability and the financial crisis severity on the firms' competitiveness is significant and negative. Thus, at 0.95% confidence level, financial crisis severity significantly affects the relationship between firm profitability and its competitiveness in the market.

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1. Introduction

The environment where firms are working is growingly and is highly competitive and in order to be survived, firms have to compete at national and international levels and expand their activities. This competition requires financial resources for new investments. But, financial resources and their applications should be optimized to be profitable (Setayesh and Kargarfard, 2011). Thus, the relationship between competitiveness and profitability can be one of the important issues of strategic management (Yannopoulos, 2010). Strategic management allows the firm to act innovatively or creatively, and not passively, to shape its future. Principals of the strategic management are based on the extent of the managers' understanding from the competing firms, markets, prices, raw material suppliers, distributors, governments, creditors, shareholders and customers around the world. These factors identify commercial success in today's world. Thus, strategic management is one of the most important tools firms can benefit from their future success (Hemmati, 2013).

On the other hand, the most important duty of financial managers is to maximize their shareholders' wealth. There are mainly two approaches used by the empirical literature to investigate the relationship between competition and performance. One is the structural approach and the other is the non-structural approach. Two hypotheses are included in the structural approach which are Structure-ConductPerformance (SCP) hypothesis and the Efficient-Structure (ES) hypothesis. These hypotheses investigate whether the superior performance in the banking sector is obtained through the collusive behavior among the large banks in the concentrated market and whether it is the higher efficiency that leads to better bank performance. On the other hand, the non-structural approaches, which derived from the development in the New Empirical Industrial Organization (NEIO) literature, stress the analysis of banks' competitive conducts in the absence of structural measures (Tan and Floros, 2014).

The SCP hypothesis is partly supported within the context of the NEIO literature by Bikker and Bos (2005). On the other hand, the Efficient Structure hypothesis states that low cost of production by relatively efficient firms enable them to compete more aggressively, capture a bigger market share and earn high profits (Fu and Heffernan, 2009). So, the higher profit achieved by banks attributes to the lower cost through either superior management or production process rather than the concentrated market. Because the efficient banks have the ability to obtain higher market share, one way to distinguish between the two hypotheses is to include both the market share and concentration in the profitability equation, if the concentration is insignificant or the market share is positively related to profitability, then it is in line with the Efficient Structure hypothesis (Tan and Floros, 2014).

Profitability is one of the most important factors in this regard. Accordingly, this study aims to investigate the relationship between market share and profitability as an index of firms' financial performance to test if profitability can be considered as an index of competitiveness of listed firms on Tehran Stock Exchange. Also, regarding the financial crisis which has recently involved Iran, the next step is examining the effect of financial crisis severity on the relationship between market share and profitability. This study is conducted between 2013 and 2017 and a regression model is used to estimate the data.

The structure of this paper is as follows: Section 2 presents the theory and literature of the study. In Section 3, hypotheses are presented. In Section 4, methodology including data gathering methods, variables and the regression model are explained. In Section 5, empirical results are presented and Section 6 is conclusion and suggestions.

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2. Theory and literature

Market share of organizations has a direct impact on profitability (Aqil et al., 2014).

Competition is considered as an in important issue at both firm and regional levels. Recently, growing emphasis has been focused on the firm level; since, there is a consensus on the point that the ability of the countries for the growth and a better standard of living for the citizens relies on the competitiveness of the firms (Stojcic et al., 2011; Voulgaris, and Lemonakis, 2014).

Significant studies, emphasizing firm-specific definition of competitiveness include Prahalad and Doz (1987), Bartlett and Ghoshal (2002) and Prahalad and Hamel (1990). They suggested that global operations and resources´ positions are the key determinants of competitiveness (Voulgaris and Lemonakis, 2014).

Increased productivity, efficiency, investment in machinery, innovations and other mechanisms of restructuring can enable firms to seize higher market share than their rivals even in the economic crisis periods (Voulgaris and Lemonakis, 2014).

Firms with positive profits are able to create barriers for preventing the entry of new firms (whose entrance would result in profit decrease to zero for all firms in the industry). Also, they are able to maintain their market shares and thus own some types of competitive advantages. Market share and profitability are so closed concepts that the term of firm competitiveness is sometimes measured by the market share or profitability´s variables.

There are many definitions of competitiveness. Porter (1980, 1990) defines competitiveness as the ability of a firm to compete in a business environment successfully. One definition focused on manufacturing (Lall, 2001) states that "competitiveness in an industrial activity refers to developing relative efficiency along with sustainable growth" (Lall et al., 2001).

Competitiveness at the firm level can be defined as "the ability of a firm to design, produce, or offer products superior to those offered by the competitors, considering the price or non-price qualities". Sources of competitiveness are the assets and processes within an organization that provide competitive advantages. Firm-level competitiveness is very important because competitive firms offer competitive advantages to their countries. Competitiveness is a sum of properties and activities of a manufacturing unit by means of which its market share and/or profit can increase in a given market, during a specific period. Market share is also a useful competitiveness indicator like profitability at the firm level. Hence, different studies identify profitability and market share as an indicator of competitiveness (Voulgaris and Lemonakis, 2014).

In other words, if there is a positive relationship between market share and profitability, active firms in the market can be considered competitive. Otherwise, the use of the term "competitiveness" for these firms is not correct.

Hence, the nature of the relationship between market share and profitability is a matter of importance for the researchers in economics, marketing, and strategic management (Venkatraman and Prescott, 1989).

Lee and Yang (2015) analyzed industrial structure, firm conduct and performance in the textile industry of Taiwan from 2006-2012, using fixed and random effects of panel data and ordinary least squares. Results showed that market structure is directly affected by the behavior of the enterprises and market performance.

Vafaei et al. (2015) examined the pattern of market structure, conduct and performance in the food and beverage industry of Iran from 1995-2007. Results suggested a negative correlation between profitability and market share.

Junior et al. (2014) examined integrating market structure, conduct and performance using value chain analysis, finding that market structure affects conduct and in return conduct affects the performance. Market performance affects conduct and market

conduct affects its structure. Also, performance can directly affect the structure.

Pourebadollahan Covich et al. (2013) examined the relationship between concentrated variables, advertisement intensity, and profitability in the food and beverage industry of Iran from 1995-2007, using a three-stage least square method. Results showed the positive effect of concentration and profitability variables on the advertisement intensity. Concentration and advertisement intensity have positive effects on profitability.

Sahoo and Mishra (2012) studied structure, conduct, and performance of Indian banking sector from 1999-2000 and 2008-2009 using the two-stage least squares method. They found a significant correlation between market structure, bank conduct, and their financial performances so that market share of the bank was directly affected by the market size, asset value, and financial performance. Also, the capital return of the bank directly affected the market share.

Tung et al. (2010) examined the market structure, conduct, and performance paradigm reapplied to the international tourist hotel industry in Taiwan from 1995-2006. Results showed a positive correlation between market performance and structure.

Fallahi et al. (2010) investigated the relationship of advertisement intensity, concentration, and profitability in Iranian industries using seemingly unrelated regression estimations. Their results showed a positive correlation between advertisement intensity, market concentration, and profitability of Iranian industries.

Pourebadollahan Covich et al. (2010) examined the pattern of market structure, conduct, and performance in the leather, shoe, and bag industry of Iran in 2007. They showed that profitability has a positive effect on market share.

In concluding these studies, it is observed that there are contradictions in the results which necessitate their reexamination. These studies have not considered effective factors in macroeconomics. One factor is inflation, which affects the trading cycle of the firms, inflation effects on the economic structure, and macroeconomic variables.

Significant studies such as Venkatraman and Prescott (1989) and Voulgaris and Lemonakis (2014) have examined the relationship between market share and profitability regarding economic conditions. The study of Venkatraman and Prescott (1989) is one of the pioneers in this field. They examined the relationship between market share and profitability in different business cycles. Results indicated that the general level of association (i.e., correlation) between market share and business profitability is stable; but, the set of significant strategic factors contributing to both market share and business profitability is different, indicating variations in the strategies for two different cycles.

Voulgaris and Lemonakis (2014) investigated the relationship between market share and firm profitability in the post-crisis period, using a sample of Greek manufacturing firms from three separate chemicals, pharmaceuticals, and plastics sectors. They suggested size and exports as effective factors in the firms´ competitiveness. However, attitudes towards macroeconomic variables are in the form of disintegrated periods; thus, a research gap exists for examining the relationship between market share and firm profitability, using macroeconomic variables with integrated attitude. This study aims to fill this gap.

3. Research hypotheses

H1. There is a significant correlation between the profitability and competitiveness of the firms in the market.

H2. There is a significant correlation between financial crisis severity and competitiveness of the firms.

H3. Financial crisis severity in the country affects the relationship between

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profitability and competitiveness of the firms in the market.

4. Methodology

This research is practical, in terms of objective. Also, the method for inferring about the research hypotheses is placed in the Descriptive-Correlation research group. In order to discover the relationships between the variables of the research, regression and correlation techniques were used, which are reasonably arguable, inductive reasoning. Further, based on the available experiments, the study is based on positive theories. To collect data, the website and quarterlies of Tehran Stock Exchange, Central Bank of Iran, and Rahavard Novin Software were used. Excel software was utilized to process the data and to test the hypotheses, Eviews 8 Software was used.

Study population included all listed firms on Tehran Stock Exchange from 2013-2017. To select the sample, systematic random sampling method was used. The sample includes137 firms with the following conditions:

1. Selected firms were not intermediaries, holdings, or banks.
2. Their fiscal year ended in the last month of winter.
3. Firms did not change their fiscal year during the study period.
4. Their financial statements were available since 2013.
5. Firms were active in Tehran Stock Exchange and did not stop their transactions during the period of study.

4.1. Variables
4.1. 1. Dependent variable
Competitiveness is the dependent variable of the study.

In this paper, market share is considered as the competitiveness proxy, obtained from dividing annual firm sale into the total sales of the industry.

4.1.2. Independent variables
Profitability: As Harrison and Kennedy (1997) argued, Profitability is estimated as the fraction of net income to the total assets (return on assets).

Financial crisis severity: There are few studies about financial crisis severity in Iran. The study of Naderi (2004), however, can be considered the richest in this regard. According to Naderi (2004), financial crisis years and severity are calculated as follows:

First, announced inflation rate of the Central Bank of Iran was extracted for 14 years (2000-2014) and the means and standard deviations of them were computed for each period. Then, based on Naderi (2004), a threshold corresponding to 1.5 times of standard deviation plus mean was determined. In fact, the years whose inflation rates were above this threshold were considered as the financial crisis years in Iran. Since a scale is required for measuring financial crisis severity, not a disintegrated variable, after calculating the threshold, it was reduced from the inflation rate of every year in the study period. The mathematical equation is as follows (Equation 1):

Equation (1).

$$Treshold.cr = \frac{\sum_{i=1}^{n} INF_i}{n} + 1.5 \sqrt{\sum_{i=1}^{n} \frac{(INF_i - \frac{\sum_{i=1}^{n} INF_i}{n})^2}{n}}$$

$$crisis_i = INF_i - Treshold.cr$$

Where,
Treshold. cr: Treshold of financial crisis
INF: Inflation rate
Crisis: Financial crisis severity

4.1.3. Control variables

Liquidity: Financial restrictions affect output firm strategies against rivals. Bolton and Scharfstein (1990) showed that firms with higher cash flows have more motivation to use more aggressive strategies towards the rivals compared to the firms with lower cash flows. Generally, a firm with good cash flows invests on different projects and gains more competitive advantages. Thus, we expect from the liquidity to be positively correlated with the market share. Liquidity is estimated as a fraction of current assets into current debts.

Financial leverage: Optimal capital structure can positively affect the profitability and market share of the firms relying on the debt. Much reliance has a negative effect (Voulgaris and Lemonakis, 2014).

Size: Size is measured by the natural log of the firm's total assets. Those large firms that use economies of scale are less risky, so they are able to achieve lower capital cost or lower cost of production. They usually use higher technologies. Thus, they may gain higher profits and market shares (Voulgaris and Lemonakis, 2014).

Fixed assets´ efficiency: They mitigate agency cost problems and production costs, increasing profitability and competitiveness (Voulgaris and Lemonakis, 2014). Efficiency results from dividing total assets over fixed assets (i.e. turnover of fixed assets).

Sales and administrative expenses: Firms which have higher costs for sale are expected to have higher sales and market shares. These statistics are obtained from dividing administrative and sale costs into the book value of the assets.

Arbitrary costs: Firms which spend arbitrary costs on their research and development and advertisements are expected to be more aggressive to their rivals (Mitani, 2014). Arbitrary costs are estimated by dividing research, development, and advertisement costs into the book value of the assets.

Growth opportunity: Firms with higher growth opportunities in the near future improve their competitiveness and market share. So, it is expected that firms with higher growth opportunities have higher market shares. The growth opportunity is calculated as follows (Equation 2):

Equation (2).

$$\text{Growth opportunity} = \frac{\text{book value of the assets} - \text{book value of equity} + \text{ market value of equity}}{\text{book value of the assets}}$$

Herfindahl-Hirschman Index: This index is the sum of squared market shares of all active firms in the industry (Equation 3):

Equation (3).

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

Where,

K=number of active firms in the industry

Market share= Market share of firm i

This index measures the degree of concentration in the industry. In this Index, the higher the estimated index, the higher the concentration and the lower the competitiveness are in the industry and vice versa. Davies and Geroski (1997) found a positive relationship between industry concentration and market share; thus, this variable was used in the regression models. Firms in the concentrated industry are faced with lower competitiveness, because they are likely to have more opportunities to expand their market shares (Mitani, 2014, 368).

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4.2. Regression model

To test the hypotheses, we need to explain the model according to the dependent, independent, and control variables. Used regression model is as follows (Equation. 4):

Equation (4).

$$Market\ share_{i,t}$$
$$= \beta_0 + \beta_1 ROA_{i,t} + \beta_2 Crisis_{i,t} + \beta_3 ROA_{i,t} * Crisis_{i,t} + \beta_4 \text{Liquidity}_{i,t}$$
$$+ \beta_5 \text{Leverage}_{i,t} + \beta_6 size_{i,t} + \beta_7 Efficiency_{i,t} + \beta_8 \text{SandA}_{i,t}$$
$$+ \beta_9 \text{Arbitrary}_{i,t} + \beta_{10} \text{Growth opportunity}_{i,t} + \beta_{11} \text{HHI}_{i,t} + \varepsilon_{i,t}$$

5. Results

This section represents descriptive data and their inferential analyses.

5.1. Descriptive statistics

For descriptive statistics, data was analyzed using central measures of mean, median, and distribution parameters such as standard deviation, skewness, and kurtosis.

Table 1. Descriptive statistics of research variables

Variables	Number of observations	Min	Max	Mean	Sd	Skewness	Kurtosis
Profitability	685	-.34	.71	.1359	.14411	.456	1.276
Financial crisis severity	685	5.80	28.10	16.3420	8.52082	.159	-1.570
Liquidity	685	.13	43.69	1.5005	2.13966	15.214	272.247
Leverage	685	1.00	4.22	1.2032	.33502	4.048	21.799
Firm size	685	10.20	19.01	14.0522	1.43194	.743	1.099
Assets efficiency	685	.00	3637.16	41.7500	278.49111	10.468	116.062
Ratio of administrative and sale costs	685	.00	.26	.0547	.03901	1.507	2.757
Arbitrary costs	685	.00	.10	.0034	.00889	5.670	43.063
Growth opportunity	685	.28	7.71	1.5498	.72953	2.618	12.501
Competitiveness	685	.00	.96	.0391	.08882	6.041	45.687

Table 1 represents that in the study period, every year 137 firms are examined and the number of observations is 685 firm-years (137×5). The mean of liquidity is 1.5 and its maximum value is 43.69. Accordingly, efficiency has more distribution than other variables. Data normality was tested using Kolmogorov-Smirnov test whose results are represented in Table 2.

Table 2. Kolmogorov-Smirnov test for competitiveness

	input	After log transfer
p-value	.000	.892

Results of Table 2 show that regarding the obtained significance level (P-value=0.892>0.05), at 95% confidence level, competitiveness index is normal. Then, the research hypotheses can be analyzed using regression tests.

5.2. Referential statistics

Before estimating the regression model, F-Limer test was conducted to decide if panel data or pooled data method used. Results of the F-Limer test are represented in Table 3.

Table 3. Results of F-Limer test

F	Degree of freedom	P-value	Accepted method
69.01	(136,535)	0.00	Panel data

Regarding the obtained result for F-Limer test in Table 3, H_0 was rejected. Then, to select from panel data with fixed or random effects, Hausman Test was conducted whose results are represented in Table 4.

Table 4. Results of Hausman Test

Hausman statistics	Degree of freedom	P-Value	Accepted method
35.11	11	0.0002	Panel data with fixed effects

As seen in Table 4, results confirmed the rejection of H_0. Thus, panel data with fixed effects are suitable for the model estimation. Table 5 represents the results of the model's estimation. According to the obtained Fisher statistics (22.725) and its P-value (0.000), it can be argued that the total study model is significant. Also, according to the determination coefficient, it can be stated that in general, the independent and control variables explain more than 27% of the dependent variable. In addition, according to the Durbin-Watson statistics´ value of 2.103, it can be claimed that there is no first-order autocorrelation between the residuals.

Table 5. Summary of the results of model estimation

Variables	Sign	Coefficients	Standard error	t	P-value	Result
Fixed coefficient	β_0	-0.396589	0.036167	-10.96563	0.0000	-
profitability	β_1	-0.011466	0.004253	-2.695855	0.0072	Negative and significant
Financial crisis severity	β_2	-0.086915	0.033511	-2.593628	0.0099	Negative and significant
Mutual effect of profitability and financial crisis	β_3	1.884241	0.643555	2.927865	0.0037	Positive and significant
Liquidity	β_4	0.000280	0.001494	0.187154	0.8516	Not significant
Leverage	β_5	-0.015014	0.008996	-1.668878	0.0956	Not significant
Size	β_6	0.033229	0.002219	14.97683	0.0000	Positive and significant
Asset efficiency	β_7	-2.18E-05	1.11E-05	-1.954211	0.0511	Not significant
Ratio of sale costs	β_8	0.344021	0.083225	4.133596	0.0000	Positive and significant
Arbitrary costs	β_9	-0.006887	0.350024	-0.019675	0.9843	Not significant
Growth opportunity	β_{10}	-0.014335	0.004643	-3.087235	0.0021	Negative and significant
Herfindahl-Hirschman index	β_{11}	-1.21E-18	4.34E-19	-2.798180	0.0053	Negative and significant
Total result of the model	Determination coefficient	0.2714		F	22.725	
	Durbin-Watson statistics	2.103		P-Value	0.000	

5.3. H1 test results

Asset return is considered as a measure of firm profitability in the regression model. Results showed that regression coefficient corresponding to the profitability index is β_1 =-0.0114. Since significance level of its P-value is 0.0072 and <0.05, the effect of

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profitability on competitiveness is negative and significant. Thus, increasing profitability decreases competitiveness. Thus, H1 is confirmed at 95% confidence level.

5.4. H2 test results

Results in Table 5 showed that regression coefficient corresponding to the financial crisis severity is $\beta_2 = -0.0869$. Since significance level of its P-value is 0.0099 and <0.05, the effect of financial crisis severity on competitiveness is negative and significant. Thus, increasing financial crisis severity decreases competitiveness. Thus, H2 is confirmed at 95% confidence level.

5.5. H*3* test results

Results in Table 5 showed that regression coefficient corresponding to the financial crisis severity and profitability is $\beta_3 = 1.884$. Since significance level of its P-value is 0.0037 and <0.05, the effect of financial crisis severity on the relationship of competitiveness and profitability is significant (P-value=0.0037<0.05). Thus, H3 is confirmed at 95% confidence level.

5.6. Other variables results

According to the table 5, among the control variables, only size and ratio of sale costs have a positive and significant relationship with the competitiveness and Growth opportunity and Herfindahl-Hirschman index have a negative and significant relationship with the competitiveness.

6. Conclusion

This research is practical, in terms of objective and the method for inferring about the research hypotheses is placed in the Descriptive-Correlation research group. In order to discover the relationships between the variables of the research, regression and correlation techniques were used. The study sample consisted of 137 firms from 2013-2017. For hypothesis testing, regression model was used.

Findings of this study showed that the effect of financial crisis severity and profitability on competitiveness is negative and significant. Thus, at 95% confidence level, financial crisis severity affects the relationship between competitiveness and profitability significantly. The negative effect of the profitability on competitiveness is because Iranian firms decrease their profitability to increase their market share. Regarding the definition of profitability in this study as the fraction of net income to total assets, this finding can be analyzed as follows. For decreasing profitability, there are two alternatives: 1. Net income decreases or 2. Total assets increases. In other words, firms decrease their earnings to get more market share if they don't change their resources. Thus, they don't use their resources efficiently. Otherwise, if they do not vary net income, they have to increase their resources. This strategy shows the lack of efficiency in using existing resources and based on the given definition of competitiveness, active firms in Tehran Stock Exchange cannot be called competitive.

The negative effect of financial crisis severity on the competitiveness indicated that financial instability in the market affects competitive strategies of the firms, leading them to the decrease of market share and using more cautious strategies. This effect is more evident in the next finding in which financial crisis severity and profitability affect the decrease of market share significantly. In other words, by increasing financial crisis severity, the negative effect of profitability on the market share is improved. In fact, by increasing financial crisis severity, firms decrease their profitability. The rationale for this result is that firms increase their resources through financing. As a result, they decrease their net income by bearing interest expenses, the conditions which are not

unimaginable in the disturbed financial status of Iran. For more clarification, the theory of the interaction of capital structure, goods´ market strategy, and production factors is reviewed here. According to this theory, there is a direct relationship between capital structure, goods´ market strategy, and production factors. Previous studies showed that active firms in the competitive industries mostly use long-term liability or the firms producing goods with high demands have higher liabilities in their capital structure. In contrast, firms with one product and high quality use lower liability in their capital structure (Ahmadpour and salami, 2006; Banimahd and Farahanifard, 2010). Thus, the firm with higher competitiveness is likely to use higher liability, bear higher financing expenses in financial crisis, and yield lower profitability. In other words, financial crisis hurts the competitiveness, involving the company in two options of either sacrificing profitability for preserving or increasing market share or losing its market share for higher profitability.

It is suggested that the government and banks support firms by giving low-interest loans to prevent the decrease in their profitability versus gaining their market shares. Also, firms should spend higher budgets on research and development whose result is improving production process and increased quality of produced goods. This issue can supply the interests of the firm and society simultaneously.

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