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PRODUCT MARKET POWER, INDUSTRY STRUCTURE, AND STOCK MARKET LIQUIDITY

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Abstract. The aim of this study was investigation the effect of product market Power and industry structure on firms' stock market liquidity. Therefore, financial data of 154 firms were studied during 2010-2015. Levin, Lin & Chu test was used to determine the reliability of research variables, and also multiple regression analysis was used to determine the relationship between the dependent and independent variables. F-Limer test was used to select the panel data model versus panel data. Research results showed the negative and significant relationship between product market power and stock market liquidity. In addition, there is a positive and significant relationship between industry structure and stock market liquidity.

Keywords: product market power, industry structure, stock market liquidity, deviation of price from competitive price, competitive structure of product markets

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1. INTRODUCTION

Competitive structure of product markets can influence on profit stability. Therefore, firms make different operational decisions. For example, they have initial marketing research, provide attractive product, decide about selling price and production, advertise for the product, supply capital, and then produce and sell to the consumers. It seems principally that structure of each industry has a key role in identification competitiveness playing role. In addition, competitiveness in each industry doesn't only root in the present competitors' performance, but has roots in basic structure of its economy (Poutsma, et al, 1987).

Therefore, regarding to today economic environment that is dynamic and sophisticated, firms are obliged to study various environmental and industrial aspects, identify the collection of opportunities and threats to have a rational reaction toward environmental changes. Thus, studying competitive aspects of an industry seems necessary as industry is a collection of firms whose products are close alternatives of each other, because everything change chronically, and competitors try to increase their market share by gaining competitive advantages. Therefore, innovation stream must continue in an organization to prevent depression and collapse for survival in the present era. Survival condition in the turbulent business world is attention to the environmental evolutions, innovation, and perception various aspects of making innovation in business. On the other hand, the significant part of economic growth belongs to the three land, workforce, and capital factors above all to the more important factor that is called organizational innovation (Sundbo, 1995).

The general goal of financial reporting is providing information to be able to help in the transaction financial effect, operations, and the effective financial events on financial conditions, and state operational results of a profiting unit, and help investors, validators, and other users in judgment and decision. Managers as the authorities of financial statement providers with more awareness about the users of financial statements potentially try to show a desirable image from a business unit. Consequently, they show the appearance of a business unit better than its real face, and increases people investment motivation out of organization in the business unit. One of the most important factors that are mentioned by many capital market investors is stock market liquidity. Liquidity is one of the main performance of stock exchange, and investors always try to have stocks with the minimum possible cost (Saeedi and Dadar, 2009). Moreover, stock market liquidity of each firm and capital market collection is important through various aspects such as the importance of liquidity in market development and growth and improves the performance of firms and total economy as the main development index of market by effect on capital cost, and it is the guarantee of the general fields of new stocks, the mentioned factor in the basket management with risk and return, effect on the effectiveness of risk coverage tools, main role of market liquidity in forming prices, cost reduction, and risk of applicants, market makers and financial systems stability (Fang et al., 2009).

Acceleration and reduction of costs in exchange process to the cash financial assets and vice versa, which means changing cash to the financial assets, is one of the important performances of financial markets, particularly stock exchange. These characteristics has known as the condition of "liquidity". Perception of the importance of liquidity in participation development in financial markets has moved the world exchanges toward essential predictors and actions to remove the problems of liquidity in these markets (Zareh Estahriji, 2002). There are several reasons to answer the question why this research is considered as a unique opportunity in Iran. First, there are many infrastructural differences between Iran and the developed countries such as US and China such as the existence of many ethics and sustainability in manufacturing industries, mother industry, and active manufacturing industries with weak efficiency. Their controlling and manager selection methods in industries are based on people beliefs and ideas and Islamic traditions which may make different risky behaviors in Iranian firms (Mashayekhi and Bazaz, 2008) Second, market size, entering price, and ability to alternate products that are used as the criterions for product market competitiveness with some environmental uncertainties of industries, the necessity to examine, relationship between products pricing, industrial structure in which they are active with the characteristics of stock market liquidity to discover the proper behavioral model in determination of the mist proper and optimum production method, marketing, and finally selling products and also examination of the efficiency and accuracy of the present theories performances in Iran new arrival markets have been appeared more than ever.

1.1. Literature and hypotheses

Research literature increases the awareness and knowledge of the researcher about the studied issue, and various methodologies are known. Therefore, first, the researcher must identify and

study the theoretical bases and research backgrounds that have been conducted in the mentioned knowledge by now. Studying the other researchers work made the researcher able to identify the present emptiness, compare this issue with the previous research, develop the present ideas, and create new ideas.

Open product power shows the firm's ability in product pricing. Market power in economic texts is called market factors power in effectiveness on good price in market (to get more benefits from full competitive conditions). Therefore, this is concluded from this view that market power is not only limited to the supplier power, demanders also take market power in some circumstances. Market power means ability to determine deviation of price from competitive price to increase profit. Empowerment process is different in various markets and is related to the market structure. In addition, financial analyzers know market power as an important factor in evaluation of a firm's landscapes. Market power means ability to determine deviation of price from competitive price to increase profit.

The necessity of the applied market power is felt more by non-competitive behaviors ascending. One practical method to measure market power is the conception of market focus. In other words, market focus measures market focus and market division among agencies. The power of firm in product pricing potentially can influence on profit management to gain some aims. Pricing power in product can act as a mechanism to enable firm to transfer price shocks to customers, reduce volatility of cash flows so reduce need to manipulation. In addition, market shows negative reaction to the failed firms to get the expected profit and it is conducted that firms with lower pricing power can manipulate their profit to reach more market expectations (Dai and Kong, 2013).

The term of competitiveness contain two opposite views: competitiveness as a structure and as a process. In the first view, competitiveness is a description of industry structure not individual agencies' description. In the second view, agencies features have an impotent role is formation of struggle and competitiveness, and competitiveness is measured based on change of competitors situations. Today, consider difference between stationary competitiveness (balance view of competitiveness) and dynamic competitiveness (process view of competitiveness). In its previous formation, the emphasize was more on price competitiveness; as though, agencies compete with each other based on advantages such as cheap workers and natural resources.Holding competitiveness in such condition depends on maintenance or reduction of production costs, and this basis is followed by many agencies in developing countries. Dynamic competitiveness is beside change in its nature; as though, it emphasizes not only on the relationship between costs and prices, nut also more on agencies abilities for learning, adaptation with market condition, and innovation. Competitiveness focuses to agencies abilities in such model to be able both to increase its technological capacities and produce products and services to compete internationally (Jafari and Tajik, 2011).

The issue of industry structure will examine industry's competitiveness level. It seems principally that first the structure of each industry has a key role in identification of game regulation. In addition, competitiveness in industry doesn't only root from the present competitors' performance, but it roots in its basic economy structure (Poutsma et al., 1987).

In addition, one related risk to the firm's stock is stock market liquidity. Stock has a high liquidity for shareholders and investors and increase demand for it. Increasing attraction and demand for the firm's stock facilitates and make easy the financial supplement, and capital increase to develop the firm.

Liquidity means easiness in buying and selling stock without change in its price (Amihud, 2002). The positive relationship between disclosure quality and stock market liquidity was proved in Iran (Fakhari and Fallah Mohammadi, 2009).

Gregoriou and Nguyen (2010) said stock market liquidity is transaction ability of course if it has little price effects. According to their ideas, the importance of stock market liquidity has a significant and positive relationship between transaction costs and investors rewards. Based on Rubin (2007) idea, liquidity of an asset includes selling and buying abilities in the minimum costs and time.

There are many reasons for this assumption that stock market liquidity is directly influenced by the firm's performance. Stock is securities with both right of liquidity supplement and supervision and voting. Transaction of these securities has a main role in supervision, evaluation, and performance of firms. It is stated in theoretical analysis that liquidity let the small shareholders to change to great shareholders, improve management salaries and advantages, and persuade the aware investors to transaction.

Therefore, having a positive relationship between liquidity and firm's performance is not far out of minds (Fang et al, 2009)

It was shown in research of Khanna and Sonti (2004) that even if there is no opposition between owner and manager, liquidity can have a positive effect on the firm's performance. Therefore, a good performance can lead to shareholders demand in capital market and increase transaction of the firm's stock and finally firm's value improves. Rubin (2007) in a research under the title of "ownership focus, ownership levels, and liquidity" stated that stock market liquidity is mainly dependent on the institutional investors and internal beneficiaries (management) of a firm. He reported the positive relationship between liquidity with the institutional investors and a negative relationship between liquidity and the main investors.

Agrawal and Hnoeber (1996) and Fang et al (2009) in this kind of research and other similar research showed the significant and positive relationship between performance of a business unit and their stock market liquidity. Actually, the secondary markets both provide liquidity and reduce capital cost by breaking price and the ability of risk transfer. Capital cost has a key role in investigation the relationship between these two criterions. Actually, less capital cost will have more economic added-value. Therefore, it can be concluded that capital cost has a significant and reverse relationship with stock market liquidity.

1.2. Theoretical bases

The term of competitiveness contains two opposite views: competitiveness as a structure and as a process. In the first view, competitiveness is a description of industry structure not individual agencies' description. In the second view, agencies feature have an impotent role is formation of struggle and competitiveness, and competitiveness is measured based on change of competitors situations. In recent decades, governmental ownership and government performance have been challenged in economic activities. On the other hand, many advertisements against private sector and trust on market are seen, and goods and service supplement in many countries that were done by government were granted to the market and private sectors in this time including water, electricity, gas, and urban public transport. Emphasis on privatizations and shrinking the government are mainly based on this assumption that firms under the private ownership act more efficiently than non-market mechanisms in market competitive conditions. The aficionados of privatization believe that if the competitive conditions are not in a definite market, privatization, and releasing program leads to competitiveness in agencies and establishment of competitiveness in market.

1.3. Background

Khajavi et al. (2013) studied the relationship between product market and profit management in listed firms in Tehran Stock Exchange. Thus, they used Harfindal-Harrishenman, Lerner, and modified Lerner indexes as competitiveness measurement indexes in product markets. The Optional accrual items have been used as a criterion for measurement of profit management. Statistical population of this research us 67 listed firms in Tehran Stock Exchange that were studied in 2004-2011. This research was quantitative and uses scientific method of construction and experimental proof and was conducted based on predefined hypotheses and designs, and librarian method was used to collect data. Results of hypotheses test in this research showed that there is a significant and reverse relationship between Harfindal-Harrishenman, Lerner, and modified Lerner indexes and profit management of firms.

GHayuri Moghadam et al (2014) in their research about the effect of competitiveness in product market on the relationship between capital structure and performance of a business unit stated that the objective of tat research was answer to the question, whether competitiveness in product market (in industry level) can change the effect of financial leverage on performance or not. In other words, whether competitiveness in market can intensify or reduce the effect of financial leverage on performance or not. For this purpose, 133 listed firms in Tehran Stock Exchange (in 6 industries) were studied in financial period of 2006-2011, and Chow and Hausman test and regression by panel data were used to test this research hypotheses. The obtained results showed that financial leverage has a U-form effect on performance. Competitiveness level has a positive and significant effect on performance, and this effect can change based on various levels of financial leverage. As though, change in financial leverage have more incremental effect on performance and its reduction reduces this effect. Moreover, one of the important results of this research is that the effect of financial leverage on performance cans also impressed by the competitiveness level. The obtained results from this research showed that increase in competitiveness level increases the effect of financial leverage on performance and its

reduction decrease this effect. The other important results of this research refer to this note that if firms areleveraged, they will obtain better performance competitiveness than the centralized market.

Ahmadpour and Rasaaeiyan (2007) had a research about the relationship between assets liquidity and stock market liquidity of the listed firms in Tehran Stock Exchange. Findings showed that samples were studied from the listed firms in Tehran Stock Exchange during 2007-2012. The liquidity criterions that was offered by optimized by Amyhud and optimized by Gopalan to correct its high skewness, and the relative difference of the suggested buying and selling price for stock have been used as the liquidity indexes of transaction that rating criterions for WAL-1 and WAL-2 of stock, and assets liquidity criterions that were offered by Gopalan than the ratio of market value to assets book value, and ratio of inventory to describe capitalstructure from short-term debts to total assets, and ratio of long-term debts to total assets as assets liquidity indexes. Research results show the positive and significant relationship between assets and stock market liquidity.

Izadinia and Rasaeiyan (2010) studied the relationship between the characteristics of stock transactions and different indexes of liquidity in Tehran Stock Exchange. The used liquidity indexes in this research include stock turnover, Amyhud ratio of non-cash liquidity, and zero return criterion, stock price difference between stock price and stock trading, and benchmark for adjusting the number of non-tradable days based on stock turnover. In order to achieve research objectives, the data of 38 firms were monthly studied in 2003-2009. This research is descriptive-correlational. Multivariate regression model with panel data was used to test hypotheses.The results of their research showed that stock transaction characteristics are the main factors of liquidity. This finding that some indexes act differently than stock transaction characteristics show that liquidity is a multidimensional and sophisticated concept that each index can only reflect one aspect of liquidity.

Saemi et al (2013) in their research studied the effect of firm size on the relationship between institutionalizing ownership and stock market liquidity of the listed firms in Tehran Stock Exchange. A sample containing 151 firms of Tehran Stock Exchange in 5-year period since 2008 to 2012 was selected and investigated. In addition, linear regression model in 95% significant level by SPSS and EXCEL software were used to test hypotheses and examine the effect of firm size on the relationship between institutionalized ownership and stock market liquidity whose results showed the reverse (negative) relationship between institutionalized ownership levels and stock market liquidity in small firms, and there is a direct (positive) relationship between institutionalized ownership levels and stock market liquidity in big firms.

Fendereski et al. (2015) studied the relationship between stock market liquidity and financial leverage. In this research, 91 listed firms in Tehran stock Exchange in 2008-2012 were studied. Research results showed the direct relationship between the extent of price gap of supply and demand and zero return with financial leverage, and reverse relationship between market depth and financial leverage.

Lang et al (2010) in an article studied the effect of transparency on liquidity and capital cost in 97799 years of firm's participation in 46 countries in 1995-2007. In this research, profit transparency was measured by the executed optional smoothing in profit. Based on this research, increasing transparency in financial reporting reduces capital cost and increases liquidity.

Datta et al (2013) in an article studied the relationship between market power, industry structure, and firm's profit management in 43628 yearsrepresented from 6019 exclusive firms in 49 industries in 1987-2007. They hypothesized in research (a) the relationships between market pricing power of the firm's product and its profit management grade and in research (b) the competitiveness of industry, market power profit management grade. Based on the obtained from this research, the product market power has a reverse relationship with the optional accrual items. Moreover, their findings are in agreement with this theory that low product market power increases the probability of firms' management on incomes; nonetheless, this probability is low in firms with more powerful market situation of product. In addition, more intensive management causes managers to limit their information disclosure more. The reported incomes byfirms with weaker pricing power and higher competitiveness, are more exposed than income manipulation than firms with higher pricing power and lower competitiveness.

Karuna et al (2012) in a research studied the relationship between product market power and profit management in 8930 firms of COMPUSTAT and 7743 firms of GAO in 1992-2003. They used market size, input cost, and alternativeness of products as a criterion for

competitiveness in product market. Moreover, findings of these researchers showed that competitiveness criterions of product have an important effect on profit management of firms.

Heflin and Shaw (2000) in a research blocked the owners and market liquidity in 349 firms in 1988-1989. They found that great shareholders access to the private information in firms with more centralized structure. Consequently, in their involved transactions, they face the transaction parties to with the risk of improper selectin until the transaction parties increase the suggested buying and selling price to reduce the risk of improper selection. Consequently, stock transactions in market reduce and stock market liquidity reduces by increase in the difference between the suggested buying and selling price.

1.4. Hypotheses

First hypothesis: there is significant relationship between product market power and stock market liquidity.

Second hypothesis: there is a significant relationship between industry structure and stock market liquidity.

2. METHODOLOGY

The methodology of research depends on objective, nature, and range of it. The objective of this study is to examine the relationship between a product market power, industry structure, and stock market liquidity.

His research is applied based on objective. The applied research objective is the practical usage of knowledge and applied knowledge development in a specific field. In addition, this research is descriptive-correlational. As this research uses the real data of the firms' financial statements (historical information), it tries to study the reasons of a definite relationships that happened in past. Therefore, it is causal and ex post facto research. Therefore, methodology of this research was correlation coefficient determination and data usage was retrospective, and the used regressive model in this research was multivariate regression model.

Statistical population of this research includes of all listed firms in Tehran Stock Exchange in 2010-2015. Thus, samples of this research for this period were 154 firms and 924 (year/firm). Using the listed firms in Tehran Stock Exchange has three main reasons in this research: first, the firms must follow a series of laws (financial and non-financial) in Exchange to be listed there until the Exchange let them enter to stock market. Second, the stock exchange is somehow under the supervision of Ministry of Economic Affairs and Finance which lead to more reliability to the listed firms. In addition, the listed firms in Tehran Stock Exchange are audited by the formal committed auditors of Stock and Exchange organization. Therefore, they have more reliability than the information of the other firms and access to the information of these firms is easier than the ones of other firms. All the present firms in statistical population that have the following criterions were selected as research sample. Therefore, firms with the following conditions were selected as sample from this population:

1-To be listed in Tehran Stock Exchange before 2009.

2-Financial year of firm ends to the last month of each year.

3-The studied firm in the definite period doesn't have financial year change.

4-The studied firm mustn't be the member investing, holding, and financial broking.

5-They have accessible data.

6-Firm's stock transactions happened frequently in Tehran Stock Exchange, and have no transaction stop more than 3 months in the mentioned stock.

Table 1. selecting sample based on research constrains

The listed firms in Tehran Stock Exchange	673
have no transaction stop more than 3 months in the mentioned stock	104
Financial year of firm ends to the last month of each year	297
Firms as the member investing, holding, and financial broking	53
Firms that have financial year change	38
Firms with non-accessible data	45
The remained firms in research statistical sample	154

154 firms were selected as sample according to the mentioned constrains for statistical sample.

Data of financial period was obtained from financial statements and reports; as though, the related data to the sample firms in 2010-2015 was extracted by resources such as Rah Avard-e Novin and Tadbirsaz software, stock exchange site, and so on, and Levin, Lin, and Chu test was used to determine the reliability of the research variables. Reliabilitymeans mean and variance of variables during period and variables co-variance were constant in different years. Moreover, parametric tests were used to analyze all hypothesis of the present research, and multivariate regression model was used to determine the relationship between dependent and independent variables. The model frompool data against panel data was examined using F-Limer test, because of Hausman test to select the panel constant effects model against panel random effects model.

Meanwhile, 1-t student test was used for each regression partial coefficients and F-Fischer test in 95% significant level (5% error) for regression model significance.

Multivariate correlational coefficient, determination coefficient, and panel regression model were sued to analyze data and test research hypotheses.

The other tests are as following:

- Examining the correlation between model errors using Durbin-Watson test
- Data normality test using Kolmogorov-Smirnov
- Pearson correlation test
- F test

2.1. The needed statistical tests to estimate models

The used statistical tests are as table 2. Later, their related descriptions will be offered.

Table 2. used statistical tests

Descriptions	used test	The used statistics
Regression hypotheses	Normality of the dependent variable	Kolmogorov-Smirnov 99 (KS)
	Collinearity among independent variables	Variance inflation factor
	Correlation	Durbin-Watson (DW)
	Unit root test	Shin and sons (2003)
Selecting a proper model	Selecting among the mutual and different intercepts	F-Limer test
	Effects constant of models between selection and random effects	Hausman test
Hypothesis test	The significance of total regression equation	F- value

Research models and variables are divided into 3 classifications:

a) Independent variables b) dependent variable c) controlling variable

2.2. Independent variables

In this study, product market power and industry structure was used as independent variables.

2.3. Product market power:

This is an independent variable of this research and shows the power of firm in pricing its products, he following relation is used to measure it:

$$PCMLI = \frac{sales - COGS - SGA}{sales}$$

In which, (LI) PCM= selling margin

COGS: the target price of the sold products

Sales: Selling

SG&A= administrative and sale costs

$$Marketpower_{it} = LI_{it} \quad \sum_{i1}^{N} LI_{it}$$

it= sale percentage of ifirm in the related industry

n= number of the present firms in the related industry

2.4. Industry Structure:

Herfindahl-Hirschman index (HHI) was used as a competitiveness measurement criterion in industry level similar to the studies of Dhaliwal et al (2008), Gröllen and Michael (2008), Flux (2009), Hey (2009)، Marseille Knight and Park (2009), and it is calculated as following:

$$HHI = \sum_{i=1}^{N_j} \left(SALES_{i,j} / \sum_{i=1}^{N_j} SALES_{i.j} \right)^2$$

In which, SALES i, j is total sales of firm i in industry j

N= number of the existed firms in industry j

Herfindahl-Hirschman index is calculated for the classification of industry levels that 5 firms at least participate. Actually, this index measured industry focus and its higher value shows higher focus and lower competitiveness, and vice versa.

2.5. Dependent variable

Stock market liquidity is considered as a dependent variable in this research.

The difference between the minimum suggested buying and selling price and the maximum suggested price is called supply and demand gap. Lower supply and demand gap leads to higher liquidity. In this research, selling and buying price range is calculated by Riyan model (1996) as following:

$$BAS = \frac{AP - BP}{\frac{AP + BP}{2}} \times 100$$

In this model, variables include:

BAS: difference range of the suggested buying and selling price of firm i in year t.

(ASK PRICE) AP: the mean suggested price for stock of firm i in year t.

(BID PRICE) BP: the mean suggested price of buying stock of firm i in year t.

2.6. Controlling variables:

The effect of the following variables on the dependent variables is controlled in this research.

1-***Firm size:*** liquidity increase distributes financial risk as much as possible by reducing basket handling cost and more motivation of investors in their transactional decisions. Identification the effective factors on it is important based on the liquidity role in discovering assets price, financial risk distribution, and reduction financial costs.

Size: the following relation is used to calculate firm size:

SIZE=LOG (number of stock* price of stock market)

2-Financial leverage

Lack of stock market liquidity makes shareholders while stock buying and selling face with costs that make investors have more return than stocks with high liquidity while buying stock.

LEV: the following relation is used to calculate financial leverage:

$$leverage = \frac{debt}{debt + mvequity}$$

3-Ratio of stock market value to book value

This ratio was used as a controlling variable that can show the firm growth opportunities in model in Namazi and Ebrahimi (2012), and Datta et al (2013).

It is necessary to change hypotheses to the statistical hypotheses to test research hypotheses. According to the related statistical hypothesis to hypothesis, the regression model is formed as following and statistical hypothesis is stated as following:

Equation (1) – to test hypothesis (1)

$$SL_{i,t} = \beta_0 + \beta_1 PCM_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_3 MTB_{i,t} + \varepsilon_{i,t} \quad (1)$$

In which, SL: stock market liquidity

SIZE**:** firm size

Size= log (number of stock *price of stock market)

LEV= financial leverage

Equation (2) - to test hypothesis (2)

$$SL_{i,t} = \beta_0 + \beta_1 HHI_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_3 MTB_{i,t} + \varepsilon_{i,t} \quad (2)$$

In which, SL: stock market liquidity is calculated as following:

$$BAS = \frac{AP - BP}{\frac{AP + BP}{2}} \times 100$$

IS: industry structure that is calculated as following:

$$HHI = \sum_{i=1}^{N_j} \left(SALES_{i,j} / \sum_{i=1}^{N_j} SALES_{i.j} \right)^2$$

SIZE: the following relation is used to calculate the firm size:

SIZE=LOG (number of stock* price of stock market)

LEV= the following relation is used to calculate financial leverage:

$$leverage = \frac{debt}{debt + mvequity}$$

Before testing hypotheses in this research, stability (stagnation), descriptive statistics and correlation were studied among variables, then F-limer and Hausman test were used to determine the most proper regression model in pool/panel state to test hypotheses in total firms' level.

2.7. Reliability of research variables in total firms' level

Results of research variables reliability in total firms' level is shown in table (3). Levin, Lin, and Chu test was used to determine the reliability of research variables, results of this test showed that variables were reliable in levels during research period, because the probability value for this test was less than 5%. Reliability means that variables mean and variance during time and variables covariance were constant.

Table 3. testing the reliability of research variables

Variable	*Sign*	*Values of Levin, Lin, and Chu test*	*Probability of Levin, Lin, and Chu test*
Value of stock market to book value	MTB	-22.184	0.000
Financial leverage	Lev	-26.521	0.0000
Firm size	SIZE	-2.046.321	0.0000
Liquidity	SL	-102.879	0.000
Product market power	PCM	-25.426	0.000
Industry structure	HHI	-284.489	0.000

3. FINDINGS

Descriptive statistics of research variable was offered in total firms' level in table (4). Results of Jarque-Bera statistics shows the normality of research variables during research period whose sig. level is all smaller than 0.05. Therefore, it can be claimed with 95% sig. level that these variables all don't have normal distribution. However, when sample volume is big, non-normality problem solved the features of research based on Stevens (2002). Stevens believes that even populations without normal distribution will have normal distribution in samples that are selected with high volume based on central limit theorem. Consequently, parametric tests can be used to analyze all the hypotheses of the present research.

Table 4. descriptive statistics of research variable in total firms' level

Variable	***Sign***	***No. observations***	***mean***	***St. dev***	***min***	***Max***	***Jarque-Bera value***	***Jarque-Bera probability***
Ratio of stock market value to book value	MTB	600	2.008	2.311	-6.597	14.043	2167.39	0.000
Financial leverage	Lev	600	0.561	0.197	0.012	0.996	17.844	0.000
Firm size	SIZE	600	13.544	1.487	9.157	18.427	18.343	0.000
Liquidity	SL	600	0.310	0.494	0.00002	0.591	9516.1	0.000
Product market power	PCM	600	0.194	0.171	0.646	0.914	85.414	0.000
Industry structure	HHI	600	0.029	0.103	0.000	0.934	3455.6	0.000

3.1. Correlation among variables in total firms' level

Correlation among research variable is shown in table (5).

The negative and significant correlation of product market power and stock market liquidity shows that firms with higher product market power has lower liquidity in research period.

Other results of correlation are shown in table (5).

Table 5, correlation among research variable

Variables / Variables		MTB	Lev	SIZE	SL	PCM	HHI
Ratio of stock market value to book value(MTB)	Correlation coefficient	1	0.057	0.366	0.111	0.083	0.192
	Sig		0.158	0.000	0.006	0.04	0.638
financial leverage (lev)	Correlation coefficient		1	-0.033	-0.026	-0.307	0.085
	Sig			0.418	0.516	0.000	0.036
Firm size(SIZE)	Correlation coefficient			1	-0.073	0.185	0.27
	Sig				0.0737	0.000	0.000
Liquidity (SL)	Correlation coefficient				1	-0.108	-0.038
	Sig					0.008	0.347
Product market power(PCM)	Correlation coefficient					1	-0.006
	Sig						0.873
HHI of industry structure	Correlation coefficient						
	Sig						

3.2. Results of regression analysis

1-Testing the first hypothesis

Research main hypothesis: there is a significant relationship between product market power and stock market liquidity.

The proper model for regression model was select before testing the first hypothesis. First, pool data model was selected by F-Limer test and compared to the panel data model. The result of F-Limer test is shown in table (6). The probability value of F-Limer was more than 5% sig, level in table (6); therefore, using pool data method is proper to test the first hypothesis.

Model	$SL_{it} = \beta_0 + \beta_1 PCM_{it} + \beta_2 SIZE_{it} + \beta_3 Lev_{it} + \beta_3 MTB_{it} + \varepsilon_{it}$		
Test	t-values	Degree of freedom	p-values
F-Limer	1.434	(9 , 496)	0.007

Table (6): selecting pool data against in panel data

Huasman test was used to select panel data model against pool data model to select panel constant effects against panel random effect model.

Table 7. selecting constant effect model against random effects model

Model determination	Hausman	
	Prod	χ^2
Random effects	0.105	7.652

Results of Hausman test are shown in table (7). Hausman p-values for research hypothesis in table (7) are more than 5% sig. level. Therefore, there is efficient reason to reject the constant effects model, and random effects model must be used to test research hypotheses.

Panel regression model of the first hypothesis is shown for total firms' level for research period in table (8).

Table 8. results of the first hypothesis test

variable	Symbol	Coefficient (Beta)	t-value	P-value
Constant value	**α**	0.647	0.68	0.000
β 1 (product market power)	**$_1$β ((PCM)**	-0.322	-4.314	0.000
β 2 (firm size)	**$_2$β (SIZE)**	-0.012	-1.093	0.247
β 3 (financial leverage)	**$_3$β (Lev)**	-0.135	-2.294	0.022
β 4 (ratio of the market value of the stock to book value)	**$_4$β (MTB)**	-0.017	-2.491	0.013
Total regression model	**F**	**P-Value**	**(D-W)**	**R^2** / **AdjR^2**
	2.386	0.004	1.909	**R^2 =0.025** / **=0.018 AdjR^2**

According to the results of first hypothesis testing that is shown in table (4-6), sig, level of f-

value was (0.004) less than the acceptable error level (5%) in gap of 1.5 to 2.5, and total regression model was significant. Therefore, there isn't any correlation among model error elements. According to the low level of p-value, t-value from the acceptable error level for β1 coefficient shows that product market power has a significant relationship with stock market liquidity. Therefore, the first hypothesis of research is accepted in 95% sig. level. Since β1 coefficient is negative, product market power has a negative relationship with stock market liquidity.

Determination coefficient and modified determination coefficient also show that the entered independent variables in regression could determine 1.8-2.5% of changes for dependent variable.

2-Testing the second hypothesis

First secondary hypothesis: there is a significant relationship between industry structure and stock market liquidity. A proper model for regression model is searched before testing the second hypothesis. Results of F-Limer test is shown in table (9). P-vales of f-Limer in table (4-7) were also smaller than 5% sig. level. Therefore, using panel data is proper to test the second hypothesis of research.

Table 9. selecting pool data against panel data

model	$SL_{it} = \beta_0 + \beta_1 HHI_{it} + \beta_2 SIZE_{it} + \beta_3 Lev_{it} + \beta_3 MTB_{it} + \varepsilon_{it}$		
test	t-value	Degree of freedom	p-value
F Limer	3.373	(99, 946)	0.000

Hausman test was conducted to select the panel data model against pool model to select the panel constant effects model against the panel random effects model.

Table 10.: selecting constant effects model against random effects model

Determination of model	Hausman	
	Prod	χ^2
Random effects	0.000 47.908	

Result of Hauman test is shown in table (10). P-value of Hausman test for research hypothesis in table (10) is less than 5% sig, level. Therefore, there is enough reason to reject the constant effects model, and random effects model must be used to test research hypothesis.

Pool regression model of the second hypothesis was shown in table (11) for total firms' level in research period.

Table 11. results of the second hypothesis

variable	Symbol	Coefficient (Beta)	t-value	P-value
Constant value	**α**	0.647	0.68	0.000
β 1 (product market power)	**$_1$β ((PCM)**	-0.322	-4.314	0.000
β 2 (firm size)	**$_2$β (SIZE)**	-0.012	-1.093	0.247
β 3 (financial leverage)	**$_3$β (Lev)**	-0.135	-2.294	0.022
β 4 (ratio of the market value of the stock to book value)	**$_4$β (MTB)**	-0.017	-2.491	0.013
Total regression model	**F**	**P-Value**	**(D-W)**	**R^2** **AdjR^2**
	2.386	0.004	1.909	**R^2 =0.025** **=0.018 AdjR^2**

According to the results of second hypothesis testing that is shown in table (11), sig, level of f-value was (0.000) less than the acceptable error level (5%), and total regression model was significant and shows a proper fitting of model. Durbin-Watson statistics (2.201) was in gap of 1.5 and 2.5. Therefore, there isn't any correlation among model error elements. According to the low level of p-value, t-value from the acceptable error level for β1 coefficient shows that industry structure has a significant relationship with stock market liquidity. Therefore, the second hypothesis of research is accepted in 95% sig. level. Since β1 coefficient is positive, industry structure has a positive relationship with stock market liquidity.

3.3. Summary of testing hypotheses

Summary of testing hypotheses are shown in table (12).

Table 12. summary of testing hypotheses results

H. no.	***Description***	***result of testing hypothesis***	
		Not rejected	***rejected***
1	There is a significant relationship between product market power and stock market liquidity	*	
2	There is a significant relationship between industry structure and stock market liquidity	*	

4. DISCUSSION AND CONCLUSION

In each research process, results are significantly important, because research conclusion can be desirable, because conclusions can be a basis to remove the present problems or to improve the present conditions.

In this research, a comprehensive analysis was conducted to study the relationship between product market power and stock market liquidity from one hand and the relationship between industry structure and stock market liquidity on the other hand in listed firms in Tehran Stock Exchange. To do this research, data of 154 firms in total firms' level was studied in six-year period and the obtained results were analyzed. Therefore, first descriptive statistical indexes were used to describe research data, then research normality was examined. Pearson correlation coefficient was used to study the correlation among variables. This research includes two hypotheses that finally multivariate regression was used to test research hypotheses.

In this research, product market power and industry structure were independent variables and stock market liquidity was dependent variable, and firm size, financial leverage, and ratio of stock market value to book value were considered as controlling variables. It is to be noticed in this research that variables were calculated by Excel software, then data was analyzed in total firms' level using Eviews 8 after pool/panel classification.

Generally, results of hypotheses testing show the negative and significant relationship between product market power and stock market liquidity, and results of the second hypothesis shows the positive and significant relationship between industry structure and stock market liquidity.

5. APPLICATIONS OF RESEARCH

This article is the first one in Iran to study the relationship between product market power and stock market liquidity and the relationship between industry structure and stock market liquidity in the listed firms in Tehran Stock Exchange. Generally, results of this research can be useful for supervising reference on the activities of the listed firms in Tehran Stock Exchange for this organization and guardian of various industries and formulator of supervisory guidelines of publishers in the listed firms of Tehran Stock Exchange of Iran. Moreover, shareholders, investors, and creditors can used the results of this research in decision making about how to attract intellectual and economic advantage of state industry, optimum production technics, and selecting other decisions for useful competitiveness by considering two concepts of today business dynamic environment and attempt to gain competitive advantage in industries. On the other hand, results of this research can help managers of the listed firms in Tehran Stock Exchange in securities and domestic and foreigner financial analysts to make decision about the best pricing technic of products, optimum production technics, and using the most efficient and flexible competitive guidelines. Research institutes and universities are another vast spectrum of users of this research results that must be aware of the latest scientific findings as science producers. They can use finings of others research and have new research by which produce science.

According to the obtained results from this research, there are other users:

According to the obtained results from this research, product market power has a negative and reverses on stock market liquidity of firms. In other words, besides change in the firm power in pricing products can justify the changes reasons in selling and buying products in possible the minimum time and cost, the existence of other factors are undeniable in the made changes in the features of stock market liquidity. Therefore, it is suggested to pay attention to this issue in the related decision makings to stock market liquidity to have selections to protect capital and increase investors and shareholders' wealth.

According to the findings of research, it is suggested to shareholders, investors, creditors, financial analysts, and brokers to pay attention to the negative relationship between product market power and stock market liquidity and positive relationship between industry structure and stock market liquidity. In addition, it is suggested to the Tehran Stock Exchange as the supervisor institute on firms and committee of auditing and accounting standards formulation to disclose the necessary information about the negative relationship between product market power and stock market liquidity and the positive relationship between industry structure and stock market liquidity. In addition, it is suggested to the managers and authorities of firms' financial supplement to pay more attention to the negative consequences of non-attention on these relationships.

6. SUGGESTIONS FOR FURTHER RESEARCH

The following cases are suggested for the further research:

- Do the present research to study the relationship between product market power and industry structure with the features of firms' stock by interruption of another criterion except these two independent variables.

- According to instability in public conditions on industry and selling and buying markets, it is suggested to the future researchers to evaluate the other effective factors on the relationship between product market power and industry structure with exchange stock market liquidity and direct and indirect effect of this process on the current performance of firms to make the necessary changes based on the present conditions in industry and market.

- Since statistical samples in this research weren't studied based on the type of industry, it is suggested to the future researchers to study the relationship between product market power and industry structure on liquidity by emphasis on type of industry and separation.

- Do this research using the middle-term financial information of firms.

- Do the present research using financial information of active firms in OTC market.

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